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ROSA VOICE

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July - Sept. 2020

IOA President Theme

*Excellence and Perfecting in Orthopaedic Education and
Patient Care : An Achievable Vision*



President 's Message

Dear ROSA Members & Friends,

Warm greetings !!

Covid19 pandemic has taught us many lessons. Learning methods have also changed to “New- Normal”. ROSA-VOICE, however has thrived with a paper print of combined issue for two quarters with efforts to deliver best in academics, updating progress of ROSA as well as bringing the other talents of members to discover hidden gems.

The whole editorial team is bent upon with continuous efforts to collect, compile and give a final shape to this quarterly magazine.

I wish you all along with your family members good health and good spirit to fight these testing times. Let us pledge to serve the society with safety, use of masks & social distancing.

Jai ROSA.

ROSA President Theme

Excellence the Artificial intelligence, because skill is strength



Dr. Rajesh Goel
President ROSA



Editor's Note...

Dear ROSA members & friends,

Warm greetings !!

We hope that you and your family members are keeping good health and spirit to fight the pandemic.

Current pandemic has shaken the world on personal, social, regional, national and international front bringing several changes in lifestyle and society. Financial challenges have weakened many sectors and electronic virtual platforms have emerged as a way of life.

ROSA, as you know, adapted to these changes pretty soon and provided digital platforms with academic excellence as reported in the earlier issue..

Our determination to continue the publication of ROSA VOICE in print format is largely not to take away the pleasure of browsing a magazine over a cup of coffee and bring smile on your face too while keeping you apprised of academics and progress of our association.

By the time this issue reaches you it would be a festive season. We wish this brings joy and happiness to washout the lockdown blues for you and your family. At the same time please do not ignore safety precautions to protect yourselves and your loved ones in these unprecedented circumstances.

We hope you like this issue and also look forward to the next one.

Have a wonderful special festive season with cherishing memories !!

Jai ROSA.

Editorial Team



Dr S.B. Solanki
Jaipur



Dr Sumit Banerjee
Jodhpur



Dr Akshat Vijay
Kota

Message from the Secretary

Respected Seniors and Dear Friends,

Greetings from the Secretariat of ROSA!

In fulfilling its mission of promoting professional education and research, and to assist the grooming and training of young orthopaedic surgeons ROSA team organized first ever virtual conference MIDTERM ROSACON 2020 on 12th July, 2020. It was a landmark event with parallel sessions in three halls, having galaxy of eminent national and international faculty members with many young and talented faculties from ROSA and virtual inaugural and valedictory functions. PG Quiz for the winner of the Dr. GirijaNath Leela Sen Gold medal was also conducted online with participation from all Medical colleges across Rajasthan. All appreciated the scientific content, punctuality and smooth conduct this virtual event.

While conducting series of successful webinars in past couple of months, ROSA members has shown their academic talent, inspiring with that Indian Cartilage Society and Maharashtra Orthopaedic Association with Bombay Orthopaedic Society has invited ROSA for joint participation in their webinars. I feel these were proud moments for ROSA fraternity and I look forward to see ROSA as more vibrant and academically renowned association.

Bone & Joint week was celebrated across Rajasthan from 1 to 7 August 2020. Even in the era of pandemic Free consultation camps, BMD camps, mask distribution, Public awareness lecture and plantation were held at Ajmer, Bharatpur, Jaipur, Jodhpur, Kota, Udaipur and many other places.

The elections are being conducted by Dr. Arun Vaishy, President Elect ROSA as the election officer. Congratulations to the unanimously elected President Elect Dr. Vinay Goyal (Jaipur).

Our past secretary Dr. Jayant Sen has put a lot of efforts and published first ROSA Member's Directory, it was highly appreciated by all the members.

ROSA Voice team is also putting all their efforts for further up gradation of contents, I request all the members to submit more and more of their relevant scientific work for publication.

In the **unprecedented** time of COVID-19 pandemic we are facing a great challenge, many of us has experienced the critical suffering and able to overcome but unfortunately we lost one of our senior member Dr. Pawan Kumar Goyal while fighting with this devastating illness. We are thankful to IOA office bearers for helping the family from IOA Benevolent Fund.

We are in the marathon stretch of the pandemic after over half a year of coping with social distancing and isolation, uncertainty, financial stressors, and changes in every walk of life, I urge to take all the precautions and stay safe.

I look forward to your continued support and guidance. Wishing you and all your near and dear one a very Happy Festive Season.

**Jai ROSA,
Jai Hind!!**



Rahul Katta
Dr. Rahul Katta
Secretary ROSA

Congratulations to Unanimously Elected



Dr. Vinay Goyal
President Elect ROSA
[President 2022]

Acetabular Fractures - What Every Pelvi-actabular Surgeon Must Know

Introduction: The human hemipelvis essentially comprises of 3 landmasses of bone viz. the ilium, acetabulum and quadrilateral plate and the superior and inferior pubic rami. These three bony islands are intricately woven together such that they are almost perpendicular to each other in the coronal plane, which makes for the complex three dimensional structure of the hemipelvis. The hemipelvis of both sides alongwith the sacrum constitute a very stable articulation, the pelvic ring, which provides the conduit for seamless weight transmission from axial to the appendicular skeleton. Understanding and treatment of injury to this complex curvaceous three dimensional structure ensues from the work of Robert Judet and Émile Letournel. The classification, mechanism of force transfer, surgical approaches, reduction techniques, complications and results described by Letournel and Judet hold good even today [1, 2]. Tannast *et al.* 2012, describe good to excellent functional results in up to 80% of operatively treated acetabular fractures at 20 years [3]. Though several variables including injury related factors, patient related and surgeon related factors govern the clinical outcome in this complex injury, concentric repositioning of the head of femur under the acetabular dome has been observed to be the single most important determinant for successful long term outcome in patients undergoing treatment for this injury [3, 4].

Relevant Surgical Anatomy: The acetabular socket is held together between the open arms of two columns, a long anterior column and a short posterior column in the form of an inverted Y. The anterior column is formed by the anterior half of iliac crest (upto gluteus medius tubercle), anterior superior iliac spine (ASIS), anterior inferior iliac spine (AIIS), ilio-psoas gutter, ilio-pectineal eminence, superior pubic ramus, ipsilateral pubic symphysis and anterior third of the inferior ischio-pubic ramus. The posterior column is comprised of posterior third of the inferior ischio-pubic ramus, ischial tuberosity, retroacetabular surface having the ischial spine and the retroacetabular surface upto the apex of the greater sciatic notch. The mid third region of the inferior ischiopubic ramus is considered the no man's area. The columns are attached to the sacrum through dense strut of bone known as sciatic buttress. Roof of acetabulum is the

weight bearing dome. There are important neurovascular structures which run in close proximity to this area and are under constant danger from the fracture of acetabulum and during surgery. Sciatic nerve and superior gluteal nerve and vessels exit the greater sciatic notch. Sciatic nerve has variable relationship with the piriformis muscle. The nerve can get injured in the posterior fracture dislocation of hip as well as in other posterior approaches. The superior gluteal neurovascular bundle is at risk in the fractures exiting the apex of the greater sciatic notch. Extensile approaches which are based on the superior gluteal neurovascular pedicle also put these at a higher risk. The deep branch of medial circumflex femoral artery runs along the inferior border of the obturator externus, then runs superiorly close to the common femoral insertion of the piriformis, obturator internus, and gemelli. There is an anastomosis between external iliac artery or inferior epigastric artery and obturator artery known as corona mortis. The corona is at risk in the anterior intra-pelvic and sometimes even in the ilioinguinal approach and may lead to significant blood loss if damaged.

Mechanism of Injury: Acetabular fractures are commonly observed due to high speed motor vehicular accidents or fall from height (> 10 ft) [5]. The injury results from impact of the head of femur against the acetabular articulating surface. The direction of application of the imploding force is usually along femoral neck or the shaft of femur. The rotation of the limb at the point of impact of the femoral head in the acetabular socket decides the type of fracture. The lower limb in external rotation results in an anterior fracture and internal rotation causes posterior injury. A fall on the greater trochanter, typically witnessed in the elderly population, essentially causes an anterior column or wall fracture [6]. The quality of bone stock is an important determinant of the degree of comminution and presence of antero-medial dome impaction (AMDI), commonly observed in this injury [7]. The suddenness of force transfer and the impact of the femur head against an acetabular socket with good bone stock may often be associated with femoral head impaction injuries, which are associated with early collapse and avascular changes in the head / degenerative arthritis of the hip despite concentric relocation of the head of femur beneath the weight bearing dome of acetabulum.

Associated injuries: Acetabular fractures are frequently associated with polytrauma situations involving multiple bone fractures, soft tissue injuries and visceral organ damage [8]. Acetabular fracture patients are often patients with a high injury severity score and multi-organ injury including head injury, chest injury, abdominal injury, genitourinary injury, spine injury and injury to neurovascular structures [8, 9]. A primary and secondary survey, as per the “Advanced Trauma Life Support” protocol is mandatory to assess and haemodynamically stabilize these patients. Internal soft tissue degloving or 'Morel Lavalle' lesions are commonly encountered in these injuries and need to be ascribed priority over bony stabilization or fixation [10]. Associated injuries not only affect the timing of the surgery but also the approach, reduction and fixation strategies which have an important bearing on the quality of reduction and fixation achieved and the subsequent long term survivorship of these hips [11]. A subset of patients may present with persistent haemodynamic instability due to pelvic vascular injury which may require urgent surgical exploration, pelvic packing or interventional radiology services.

Evaluation: Once the polytraumatized or acetabulo-pelvic injured patient is haemodynamically stabilized, evaluation for definitive management of the pelvi-acetabular injury form the cornerstone of management. Investigations need to be focussed on defining the classification, degree of comminution, marginal impaction, head impaction, degree of hip instability and concomitant pelvic ring damage.

The prescribed set of primary investigations for an acetabulo-pelvic injury include

- 1) Pelvis with both femur AP X-Ray
- 2) Pelvis with both femur 45 degree Internal rotation AP (Obturator oblique Judet view)
- 3) Pelvis with both femur 45 degree External rotation AP (Iliac oblique Judet view)
- 4) 2D / Axial CT scan
- 5) 3D CT scan

The important landmarks to note on an AP pelvis radiograph include

- 1) Iliopectineal line
- 2) Ilioschial line
- 3) Roof of acetabulum
- 4) Tear drop
- 5) Anterior rim of acetabulum
- 6) Posterior rim of acetabulum
- 7) Obturator foramen
- 8) Iliac wing

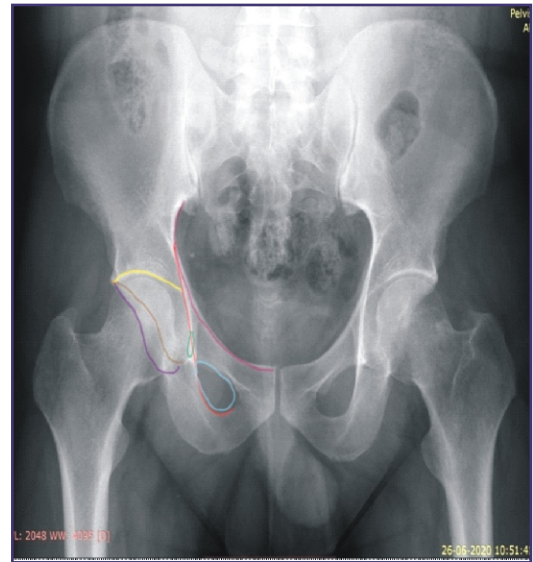


Fig 1- Illustration of radiological landmarks seen on pelvis AP view: 1. Ilioschial line; 2. Iliopectineal line 3. Obturator foramen; 4. Tear drop; 5. Posterior rim; 6. Anterior rim; 7. Acetabular dome.

The iliopectineal line denotes anterior column. Ilioschial line represents posterior column. Roof is the weight bearing region of the acetabulum. The tear drop represents the antero-infero-medial part of the acetabular socket. The anterior and posterior rims represent the integrity of the anterior and posterior walls of the acetabulum. Primary fracture line breaking into the obturator foramen and iliac wing are indicators of inferior and superior extension of the fracture.

Iliac oblique view: Hemi pelvis tilted 45 degree away from X-ray beam. Posterior column and anterior rim of acetabulum are best seen on this view.



Fig 2- Post-operative iliac oblique view of pelvis: A patient of posterior hip dislocation with posterior wall fracture. A. Outline of posterior column B. Anterior wall.

Obturator oblique view: Hemi pelvis is rotated 45 degree towards the X-ray beam. Anterior column and posterior rim are best seen on this view.

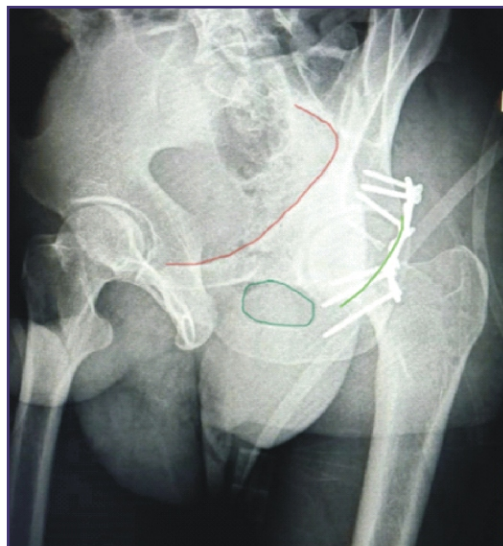


Fig 3- Post-operative obturator oblique view (Same patient). A. Iliopectineal line B. Acetabular dome C. Posterior wall D. Obturator foramen.

CT scan is an adjunct to the three radiographic projections and further defines the fracture morphology. The two dimensional axial images (from superior to inferior) give additional information about:

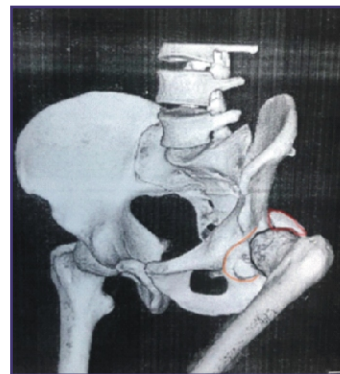
- 1) Injury to the SI joint
- 2) Injury to Sacrum
- 3) Involvement of the dome
- 4) Pattern or classification of the injury
- 5) Presence of joint mouse or intra-articular fragments
- 6) Presence of incarcerated articular fragments
- 7) Presence of marginal impaction
- 8) Extent of involvement of the anterior and posterior wall
- 9) Type of fracture and pattern of involvement

Three dimensional CT gives invaluable information about rotation of the key column, wall and dome fragments and is a useful pre op planning tool.



A.

B.



C.

Fig 4- A, B, C: (Same patient)3D CT images showing (Arrows) comminuted fracture of posterior acetabular wall with subluxated femoral head.

Classification: Letournel and Judet's classification is the only classification which has significant inter and intraobserver reliability and repeatability [12]. Letournel and Judet classified acetabular fractures into 'Elementary fractures' and 'Complex' or 'Associated fractures'.

Elementary fractures:

1. Posterior wall (25%): - Most common fracture subtype. Maybe associated with marginal impaction. It can be best visualized in AP and obturator oblique view.
2. Posterior column (3% to 5%): - The fracture begins at apex of greater sciatic notch, runs down along the articular surface, quadrilateral surface, notch and exits the inferior ischiopubic ramus. AP view denotes the disruption of ilioischial line, posterior rim and inferior ramus. Involvement of the posterior border of the bone can be seen in the iliac oblique view. This injury pattern may injure the superior gluteal neurovascular bundle if the fracture exits the greater sciatic notch very high.
3. Anterior wall (1% to 2%): - It can involve the anterior inferior iliac spine, articular surface of the acetabulum. It involves a variable part of the pelvic brim and goes down the quadrilateral surface a variable distance depending upon the size of the wall fragment. There is also a variant of this fracture that does not involve the pelvic brim. AP view shows the displacement of iliopectineal line and anterior rim at two places.
4. Anterior column (AC) (3% to 5%):- Depending upon anterior exit of the fracture line, it can be high AC, where fracture line exits anterior iliac crest, intermediate AC exits at or close to the anterior superior iliac spine, low AC exits at the psoas gutter and /or the iliopectineal eminence and very low AC when the fracture exits distal to the iliopectineal

eminence at variable distance on the superior pubic ramus. All the subtypes involve pelvic brim, quadrilateral surface, ischiopubic ramus. Very low anterior column fracture and anterior wall fracture can be differentiated as the former involves inferior pubic ramus and breaks iliopectineal line at one place; the very low variety may sometimes not involve the acetabular socket at all.

5. Transverse (5% to 19%):- It involves both anterior and posterior columns of the acetabular socket. It can be transtectal if fracture line crosses the weight bearing dome, juxtatectal if it crosses above cotyloid fossa and infratectal it crosses through the cotyloid fossa. AP view shows the disruption of both iliopectineal and ilioischial line. The ischiopubic fragment rotates around the anterior pubic hinge. There is more posterior translation than the anterior.

Associated fractures:

1. Posterior column and posterior wall (3% to 4%):- The fracture line involves ilioischial line, posterior border of innominate bone and posterior rim.
2. Transverse and posterior wall (20%):- Same as transverse fracture pattern it can be transtectal, juxtatectal or infratectal. Posterior or central dislocation of femoral head is common and must be recognized early. Wall component is usually a standard posterior wall or an extended posterior wall fracture.
3. Anterior column or wall with posterior hemi transverse (7%):- Primarily an anterior column or wall fracture with a secondary fracture line involving the posterior column. This along with isolated anterior column fractures is the common pattern seen in elderly patients. Impaction of medial roof is generally associated with this fracture which is radiologically evident as “gull wing “sign. It is a poor prognostic indicator in terms of survivorship of the hip.
4. T shaped (7%):- There is a transverse fracture line with an inferior fracture line exiting the ischiopubic ramus and divides ischiopubic articular surface into anterior and posterior parts, both independent of each other.
5. Both column (23%):- Most common subtype of the associated fracture. Acetabular articular surface is totally detached from the innominate bone. The articular fragments may displace or rotate but they remain congruent to femoral head, this is known secondary congruence. “Spur sign” seen on obturator oblique view is pathognomic to this fracture pattern.

Management: Can be

- a) Non operative
- b) Operative

Non Operative: The surgical advancement in acetabular injuries has narrowed down the indications of non-operative treatment to undisplaced or minimally displaced fractures with intact weight bearing dome and stable hip. Both column fractures are also amenable to conservative treatment owing to secondary congruence. Sometimes, general condition of the patient and associated injuries also preclude operative management [13]. Involvement of weight bearing dome can be excluded by measuring roof arc angles and axial CT scan. Roof arc angle should be less than 45 degree in all three radiographic views without traction and fracture line should not be within 10 mm of acetabular dome on axial CT cuts [3]. The roof arc measurements are not valid for both column and posterior wall fractures due to detachment of articular dome from innominate bone in both column fractures and fracture line present posterior to roof arc in posterior wall injuries. The dynamic stress test and 2D CT are the reliable modalities to assess the hip stability in posterior wall fractures. The hip is unstable if more than 50% of articular surface is involved on 2D CT. If the involvement is less than 20% or between 20%-50%, dynamic stress testing is the most important determinant of hip instability [14]. Sen *et al.* [15] concluded that if concentric fracture reduction can be attained and maintained by skeletal traction, an acceptable outcome can be expected in conservative treatment.

Operative: Concentric reduction of femoral head under acetabular dome is the single most important determinant of functional outcome in acetabular fractures [16].

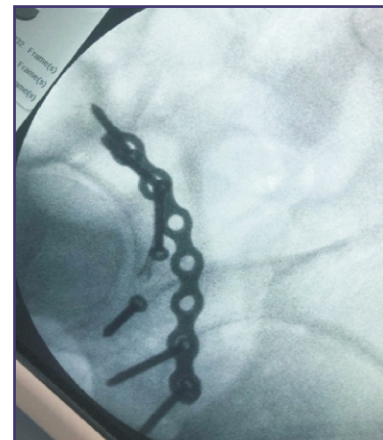


Fig 5- (Same patient) Intraoperative imaging (Arrow) shows concentric reduction of femoral head under acetabular dome.

Approaches and principles of fracture reduction given by Judet and Letournel are still followed. The key concept in choice of approach is that it should be the least invasive intervention which allows anatomic reduction and stable fixation of the key fragments, thereby enabling reversal of the mechanism of injury. There are three main approaches ilioinguinal, iliofemoral and Kocher-Langenbeck [4]. The ilioinguinal approach is suitable for the anterior wall, anterior column and anterior column with posterior hemitransverse fractures. The Kocher-Langenbeck approach is used for the posterior wall, posterior column, and posterior column with posterior wall and most transverse fractures especially the juxta tectal and infratectal variety. For transtectal transverse fractures, T type fracture, transverse with posterior wall fracture and both column fractures, approach is individualized as per the fracture configuration. Extended iliofemoral approach is reserved for the cases with delayed presentation and complex fracture patterns. New surgical approaches like modified Gibson, modified stoppa, trochanteric flip osteotomy and sequential anterior and posterior approach have been added over time, each with their own advantages and disadvantages over conventional approaches. The most interest is seen in the anterior intrapelvic (AIP) approach as it directly visualizes the true pelvis and the infrapectineal part of the pelvis and accords the ability to most effectively deal with AMDI [17]. This particular advantage has fired up interest in the approach and most of the new developments in implants are focussed on AIP. Fracture reduction is facilitated by longitudinal and lateral traction. First column is reduced and fixed followed by wall fragment [3]. Percutaneous fixation is an alternative to the open reduction and internal fixation in minimally displaced fractures without comminution [18]. Surgical failures are common among the elderly owing to poor bone stock. Acute THA with internal fixation has emerged as a viable option in these cases [19]. Despite the recent advancements, the acetabular surgeries still have high complication rates and entail a long learning curve. Degenerative arthritis is the commonest complication in these acetabular injuries; the quality of fracture reduction being the major predicting factor of late onset degenerative arthritis. Heterotopic ossification (HO) is more common in posterior and extensile approaches with stripping of soft tissue. Indomethacin and low dose radiation are used as prophylaxis for HO [20]. Other complications include infections, osteonecrosis of the femoral head, iatrogenic nerve injury and venous thromboembolism (VTE). The incidence of VTE is as

high as 28% in indian population and warrants a thromboprophylaxis in all patients with acetabular fractures[21].

In summary, acetabulo-pelvic injuries are complex injuries resulting from high velocity force transfer, often associated with multiorgan and multiple bony injuries. The key to long term pain free survivorship of the hip post this constellation of injuries is concentric relocation of the femoral head under the dome of the acetabulum and perfect restoration of articular congruity. Understanding the type of injury, accurate classification alongwith identification of critical issues like marginal impaction, intra-articular comminution, incarceration of articular fragments, quality of bone stock, femoral head impaction and various other injury related, patient related and surgeon related factors provide for accurate and judicious choice of treatment. Success of treatment lies in meticulous choice of approach (single non extensile or combination of approaches) to facilitate accurate reduction through the least invasive approach and stable internal fixation to allow for early post operative mobilization of the joint to ensure full functional range of motion of the erstwhile injured hip.

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Dr. Abhay Elhence

MS (Orth.), DNB (Orth.), MNAMS, MCh. Orth. (UK)
Professor Orthopaedics, AIIMS Jodhpur

Dr. Ankit Rai

MS (Orth.)
Senior Resident Orthopaedics, AIIMS Jodhpur

ROSA Best Publication Award

1. Paper Published in Indexed National or International Journals
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[From Jan. to Dec. 2020]

Please apply with a copy of your publication to editor.rosavoice@gmail.com / rahulkatta@hotmail.com

Last date for applications: **20th December 2020**

Fracture Neck of Femur - The Unsolved Fracture ?

Although Kellogg Speed used the title in a paper presented before the American College of Surgeons as early as 1934, the term “Unsolved Fracture” is attributed to Dickinson from his paper in the JBJS in 1953¹.

When dealing with the so called unsolved fracture, distinction has to be made between the undisplaced and displaced fractures of the femoral neck. Undisplaced fracture like Garden type I and II is a different ball game, in that, if appropriately fixed rigidly with an implant that gives adequate stability, the results are uniformly good and complications like non-union unusual, though avascular necrosis is still a viable possibility. In fact, Whitman was treating them with his well moulded hip spica, albeit he never published his results.

In 2018, in the British volume Bone and Joint Journal, a review of 79 patients with age more than 70 years with undisplaced fractures fixed in situ by cancellous screws was published. 41 patients had a healed fracture on radiographs (89.1%), 5 patients had AVN, 4 patients had non-union and 1 patient had AVN with non-union. The radiographic failure rate was 22%².

Another study published in the “EFFORT” proceedings, about 98 fractures in 93 patients, with 52 Garden I fractures, 34 Garden II fractures and 12 Garden III and IV fractures, were treated with three cancellous screws in two different configurations. 71 patients (83%) had a good functional outcome. There was nonunion in seven fractures (7%) and avascular necrosis of the femoral head (AVN) in five (5%). There was no difference in the functional outcome, number of nonunion and AVN between both groups of fixation. There was a difference in the outcome which depended on the Garden type of fracture and the accuracy of reduction. Most complications were observed in Garden's III and IV fractures with inaccurate reduction³.

Obviously, things are not so bright for the displaced fractures. By far, excluding the iatrogenic operative causes, the non-union rate by average is 25% and the subsequent avascular necrosis rate hovering around 40%⁴.

In a paper on a multicentric series of displaced femoral neck fractures in patients 60 years of age or younger treated with internal fixation with the dynamic locking blade plate, 106 patients were reviewed for outcome measures like failure in fracture healing due to nonunion, avascular necrosis, or implant failure requiring

revision surgery. The failure rate was 13.2%. Avascular necrosis occurred in 11 patients (10.4%), nonunion in six (5.6%), and loss of fixation in two (1.9%)⁵.

Another paper discussed whether fixation technique matters in displaced intracapsular hip fractures in patients younger than 65 years of age. Fixation devices studied were, cannulated cancellous screw (CCS) and the Targon Femoral Neck (TFN) hip fixed angle screw. Operative time did differ significantly between the two groups, with the TFN requiring more operative time. Complication rates for the treatment of displaced intracapsular fracture with TFN and CCS showed no significant differences; however, the functional outcomes, as presented by the NAS and Mental health composite score showed superiority for CCS treatment; which also scored in terms of cost of implant⁶.

From the Danish Fracture Database, 1,206 consecutive surgeries for a primary femoral neck fracture treated with use of parallel implants during the period of December 2011 to November 2015 were reviewed. Two implants were used in 997 cases and 3 implants were used in 209. The end point of the study was re-operation or death of patient. Patients <70 years of age were more likely to undergo reoperation (18.0%). Time to surgery was associated with increased risk of reoperation for displaced fractures. Operative causes like insufficient fracture reduction, placement of the implants with an angle to the shaft of $\leq 125^\circ$, and femoral head perforation significantly increased the risk of reoperation. The study concluded that sufficient fracture reduction is perhaps more important than focusing on an optimal position of the implants⁷.

In a consecutive series of 320 patients with an intracapsular fracture of the hip treated with a dynamic locking plate (Targon Femoral Neck (TFN)) were reviewed. All surviving patients were followed for a minimum of two years. There were 112 undisplaced fractures, of which three (2.7%) developed nonunion or re-displacement and five (4.5%) developed avascular necrosis of the femoral head. Revision to an arthroplasty was required for five patients (4.5%). A further six patients (5.4%) had elective removal of the plate and screws. There were 208 displaced fractures, of which 32 (15.4%) developed nonunion or re-displacement and 23 (11.1%) developed avascular necrosis. A further four patients (1.9%) developed a secondary fracture around the TFN. Revision to a hip replacement was required for

43 patients (20.7%) and a further seven (3.3%) had elective removal of the plate and screws⁸.

The study suggested that the stronger distal fixation combined with rotational stability may lead to a reduced incidence of complications related to the healing of the fracture when compared with other contemporary fixation devices. It would appear that an additional anti rotation screw would, and does, serve the same purpose as a Targon Femoral neck hip screw, and at a substantially lower cost.

Another study compared the Targon Femoral Neck (TFN) hip screw, with the current standard treatment of cannulated screw fixation. This was a single-centre, participant-blinded, randomized controlled trial. 174 patients aged 65 years and over with either a displaced or undisplaced intracapsular fracture were included. The primary outcome was the risk of revision surgery within one year of fixation. The absolute reduction in risk of revision was of 4.7% in favour of the TFN hip screw. It came to a similar conclusion that fracture displacement was a significant predictor of risk of revision⁹.

Thus it is amply clear that a number of issues contribute to the poor results in the displaced fractures of neck of femur. To list a few, age, type of fracture, degree and type of displacement, comminution, timing of operation, accuracy and gentleness of reduction, stability of reduction, accuracy and rigidity of fixation, timing of weight bearing are all determinants in the outcome of these fractures. A follow up of at least two year would be required to exclude the important and predominant complication of avascular necrosis.

When we were residents the treatment of displaced fractures of the femoral neck was largely influenced by age, namely, younger than fifty conserve the head, older than sixty sacrifice the head. Between fifty and sixty was a grey zone where such unfathomable reasons such as availability of implant, whim of the treating surgeon or patients fancy, affordability and physique and physiology played a deciding factor. As Dr P K Sethi used to say, "you have to sell the operation to the patient", and so it boiled down to what you wanted to sell.

In our time, the brunt of head conservation was to do an accurate and gentle reduction, and fix it with a Smith Peterson Nail. Garden's innovation of low angle nail was yet to catch on, before the concept of the Cancellous screws and the DHS took over. On going through the literature of last ten years, as done by me before, one comes across series that have used Targon femoral neck hip screw, Cannulated Cancellous screw, dynamic locking blade plate and sliding hip screw with dynamic locking plate and a cephalomedullary nail in the basi-

cervical fracture neck of femur. What is important in any evaluation of outcome is; the role of poor surgery by way of inadequate reduction, poor placement of implant and unusual haste in weight bearing. An ill-conceived rehabilitation programme has to be excluded or duly weighed.

An article in 2011 published in the JBJS reviewed eighty-four articles representing seventy-four unique, randomized, controlled trials, including thirty-three on femoral neck fractures. The authors concluded that fracture type does not appear to be independently related to patient outcomes. Mortality, pain, function, and quality of life did not differ by surgical implant class, or by implants within a class. The broader questions about the relationship of patient factors, fracture type, and specific treatments to the outcomes of mortality, functional status, and quality of life cannot be addressed with the existing literature¹⁰.

This brings to my mind an editorial by E A Nicoll in the JBJS of May 1963¹¹. He quoted Hargadan and Pearson as age, level of fracture and displacement being significant factors in contributing to non-union, though Garden's series excluded age as a significant factor. The degree of displacement between Garden Grade III and IV gave substantially different non-union rates. What seems to contribute most to the incidence of non-union and ischaemic necrosis is the comminution and the vascularity of the head. The former seems to be more significant as it also affects the vascularity of the retinacular vessels and affects the stability of the reduction.

All implants which provide a rigid stable fixation of a well reduced fracture will produce good or satisfactory results, as is evident from all the published series which I have quoted above.

Prospective randomized studies comparing internal fixation and a cemented hip replacement in the treatment of displaced femoral neck fractures have shown favorable short-term results for prosthetic replacement. The discussed report compares the results after a minimum of fifteen years. 143 patients (146 hips) were randomized to closed reduction and internal fixation with two screws (n = 78) or a cemented total hip replacement (n = 68). The average age of the patients was 84 years (range 75 to 101 years). Failure after internal fixation was defined as early redisplacement, nonunion, symptomatic segmental collapse, or deep infection. In the arthroplasty group, failure was defined as two dislocations or more, implant loosening, deep infection, or a periprosthetic fracture. The failure rate was 55% after internal fixation compared with 5% after total hip replacement¹².

Since there is no satisfactory method of establishing the vascularity of the head, the incidence of avascular necrosis of the head is less predictable as an outcome. Some contend that all these heads are dead, but there are differing degrees of ischaemia in every case and the place of a viable head is still on the neck of femur, and therefore Dr Sethi was against sacrificing the head in all and sundry.

The factor weighing against a prosthetic replacement, according to him, was that the life of the prosthesis was limited, whereas the natural head was for the life of the patient. The replaced hip could also not cater to the floor sitting culture of the Indian patient and the need to squat and sit cross-legged. What I often wondered that despite the patient who underwent conservative surgery for that matter, neither could do that, at least in a majority of cases. The fact that about one in three or four would end up with AVN hip or head collapse and arthritis requiring the so called "two stage arthroplasty" was a fact and notwithstanding. So why not a primary arthroplasty? The evolving technology and technique of replacement arthroplasty would tend to shift the paradigm predominantly in favour of primary hip replacement in displaced fractures of the neck of femur. Let's tally ho a little!

"The blandishment of such an approach are difficult to resist, but it is after all, an extreme form of correction to decapitate all suspects in order to catch the culprits" as Nicoll puts it¹¹.

Cases that are retrievable by conservative surgery and those who qualify for a primary prosthetic replacement can be adequately assessed only after a multicentric trial of more than 500 cases which takes into account age of patient, type of fracture, degree and type of displacement, comminution, timing of surgery, accuracy and gentleness of reduction, stability of reduction, accuracy and rigidity of fixation, timing of weight bearing and other relevant factors over a minimum period of follow-up of three years. Only then can the role of primary arthroplasty in displaced fractures of the femoral neck be enunciated in deference to conservative surgery, instead of becoming the panacea.

"The Queen had only one way of settling all difficulties, great or small, 'Off with his head'" - from Alice in Wonderland by Lewis Carroll

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Dr. Rakesh Bhargva

Professor & HOD, Department of Orthopaedics
NIMS University, Jaipur
Retd. Professor, SMS Medical College, Jaipur

Intertrochanteric Fractures : DHS to Nails : What Matters in Achieving A Good Functional Outcome ?

An intertrochanteric fracture is an important game changing event in the life of any patient. It is watershed between independence and dependence also affecting ones personal and social life. With a huge aging population in India the incidence is expected to at least double in coming decade if not more. Managing medical comorbidities effectively and joint management of patients with multicare team is the best option for successful outcome. With increasing life expectancy, minimising failures which are known with these fractures, is very important for good outcome.

30% of patients with hip fractures may die within first year from medical comorbidities, related complications or aggravation of conditions indirectly as a result of fracture or treatment. Surgery reduces the mortality rate when compared with non operative care as well as decreases indirect healthcare costs of long term supervised care. As only 1/4 patients will achieve independent ambulation after surgery, postoperative rehabilitation and monitoring is a very important part of the management.

Factors that decide successful outcome are related to patient and surgeon



Figure - 1 : (Male 54, Active Slipped on Wet Surface)

Patient factors include age and comorbidities, osteoporosis, fracture geometry that is unique and beyond our control. Surgeon can control fracture reduction, choice and placement of implant in hip which have a huge impact on successful outcome. In a younger patient

avoiding shortening of neck has relevance to post operative gait pattern and the final functional outcome.



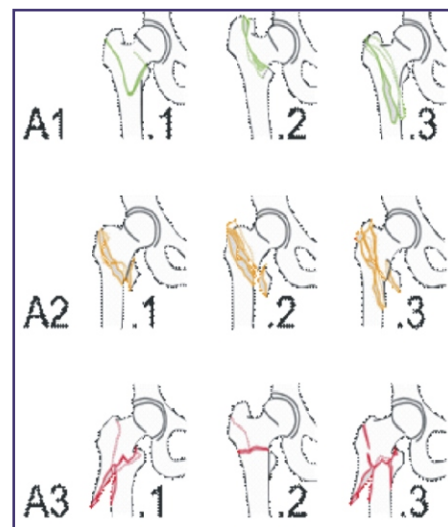
Figure - 2 : F, 100 Yrs, Initial X-ray Normal

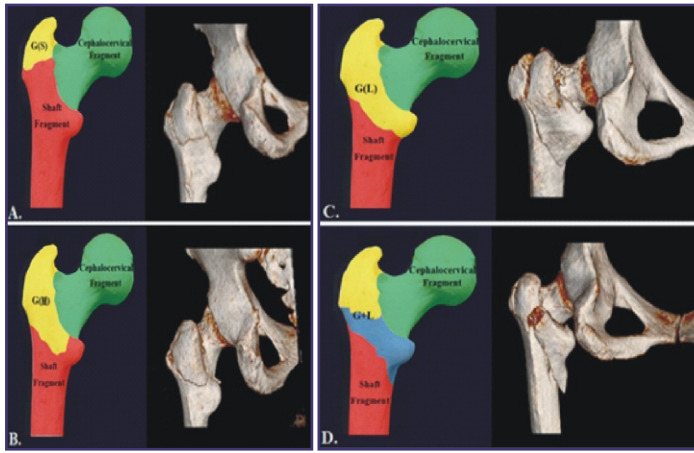


Figure - 3 : 2 Weeks Later X-ray.

When one cannot see a fracture in a symptomatic patient keeping the hip under observation with limited weight bearing followed by repeat Xray at regular intervals, CT or MRI scan if possible helps to avoid a missed fracture.

Fracture geometry:





Better understanding of fracture morphology has come in recent years with use of CT scans as it also helps in planning surgical treatment of complex comminuted fractures with choice and implant placement.

The choice of implant is variable with specific role for a particular implant. Dynamic Hip Screw (DHS) and Intramedullary (IM) nails remain the mainstay of our choices.

Important points to consider for good outcome -

- 1) Lateral wall is a very important predictor for outcome
- 2) Identification of unstable fracture pattern is important
- 3) Ideal choice and placement of implant is crucial
- 4) Early mobilization and proper rehabilitation reduces complications
- 5) Bone quality plays a important role

Implant Choices -

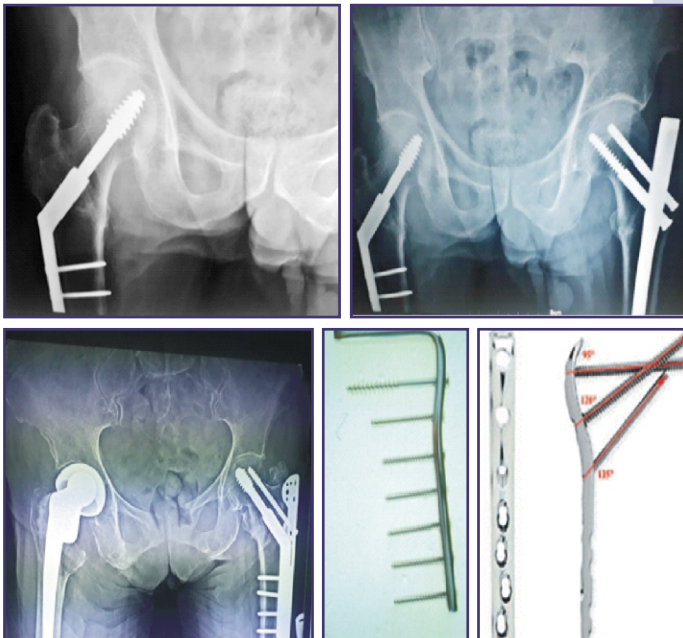
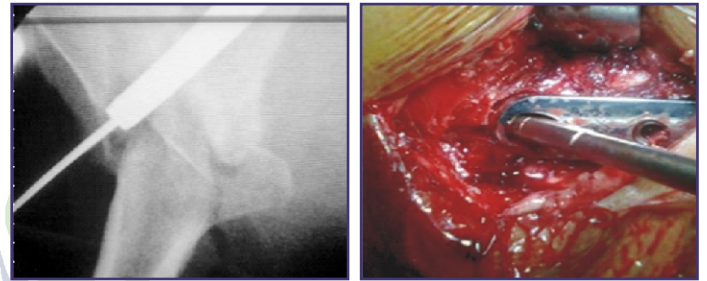
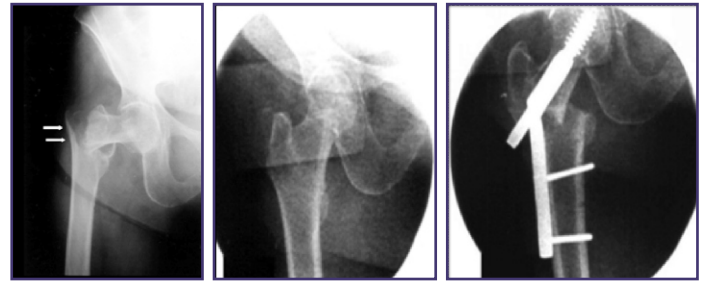


Figure - 3 : Implant choices

Upto A1 123 and ?A2 1 DHS works well.

Intramedullary nails have distinct advantage in A3 patterns. With potential intraoperative instability, A2 2,3 nails are preferred or if you use DHS then a trochanteric buttress plate shall be necessary.



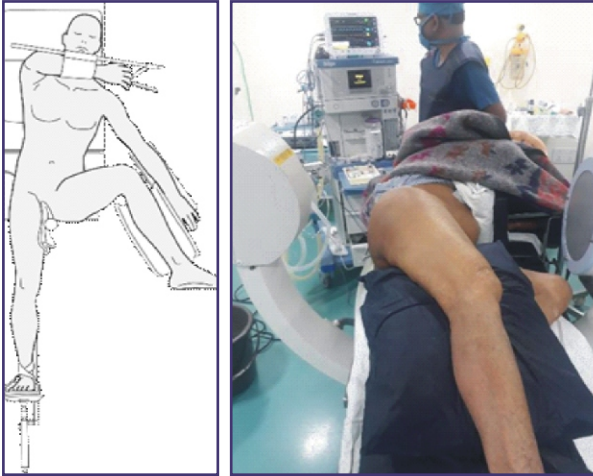
Trochanteric buttress plate works by preventing medialisation especially when intraoperative breaks are noted. The second screw fits to DHS plate only while the rest of three screws fix both plates together.

Reduction: Fracture reduction is key factor determining outcome. Reduction is done usually closed by gentle manipulation with traction. It restores neck shaft angle, improves contact and reduces stress on implant. Whenever necessary mini open or joystick guided reduction is done as it is the key factor in fracture outcome. Use of percutaneous clamps, reduction devices, cerclage wiring are all adjuncts to improve and maintain reduction. They should be used whenever necessary.

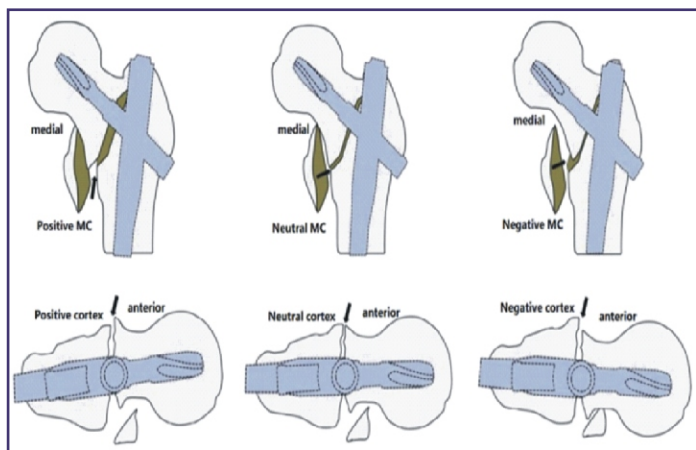
Recent literature highlights reduction techniques, types and its significance towards outcome.

Though the use of fracture table is preferred as it

facilitates C-arm imaging , alternate options like lateral position is very useful especially when nailing fractures in very obese patients.



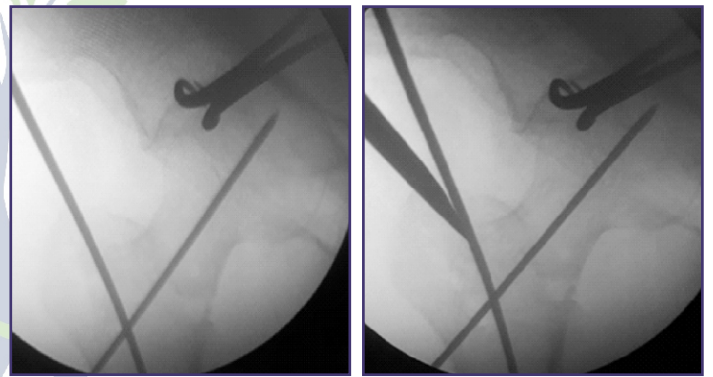
Use open reduction whenever necessary especially when closed reduction is not successful or difficult to maintain. This is more relevant with nailing when it is not advised to take entry without a well reduced fracture.



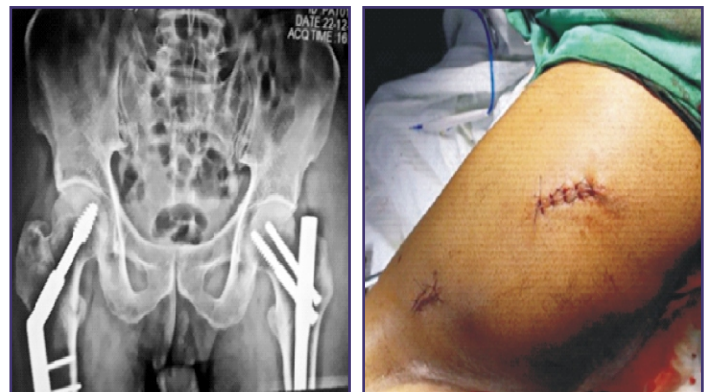
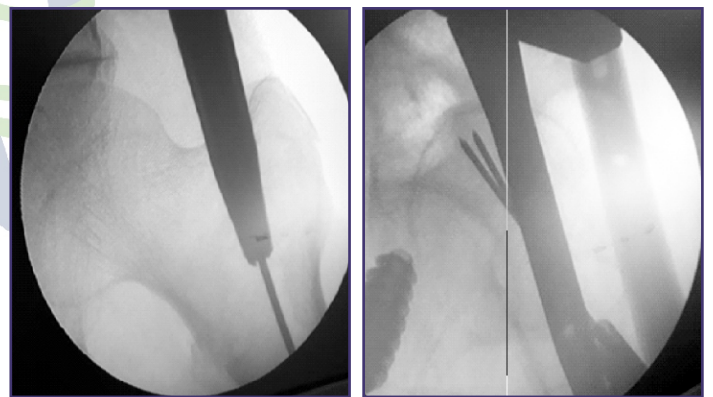
Attention has been drawn to significance of positive reduction in decreasing chances of implant failure with intramedullary nailing. The anteromedial reduction as described by Carr et al has significance.

Intramedullary nailing is a minimal invasive technique of fracture stabilisation with advantages of less blood loss, better stability in certain fracture patterns and is the preferred method of intertrochanteric fracture fixation amongst newer generation of surgeons. Debate exists between use of short or long nails, two screws or a single screw, blade or screw. The evidence is evolving but costs has important bearing while selecting implant in our country.

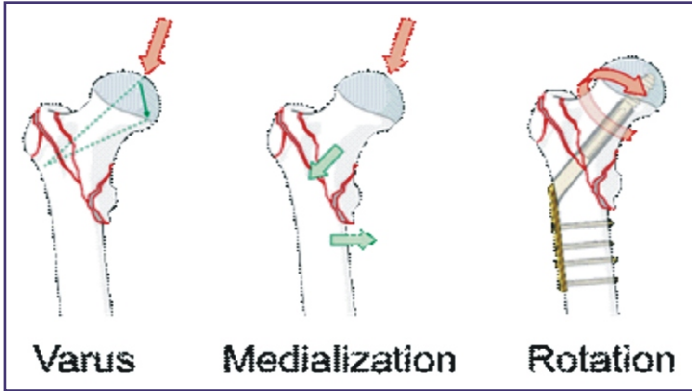
Intramedullary nailing involves set steps of positioning, reduction , entry, guidewire positioning followed by reaming, nail passage, proximal and distal locking.



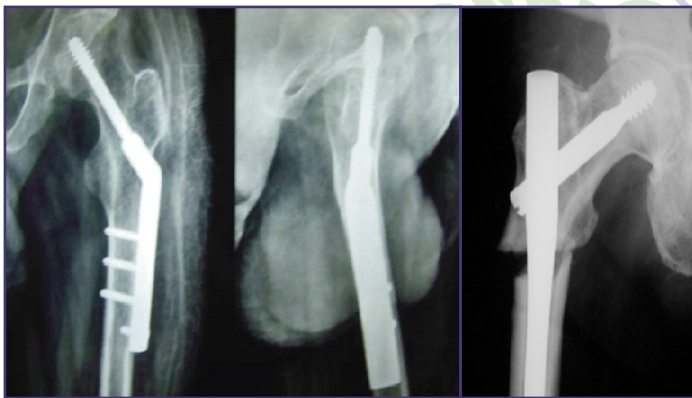
Medialisation of Guide Wire Entry



Give due consideration to avoid varus, medialisation and rotational deformity of proximal fragment as they all predispose to implant failure from secondary instability.

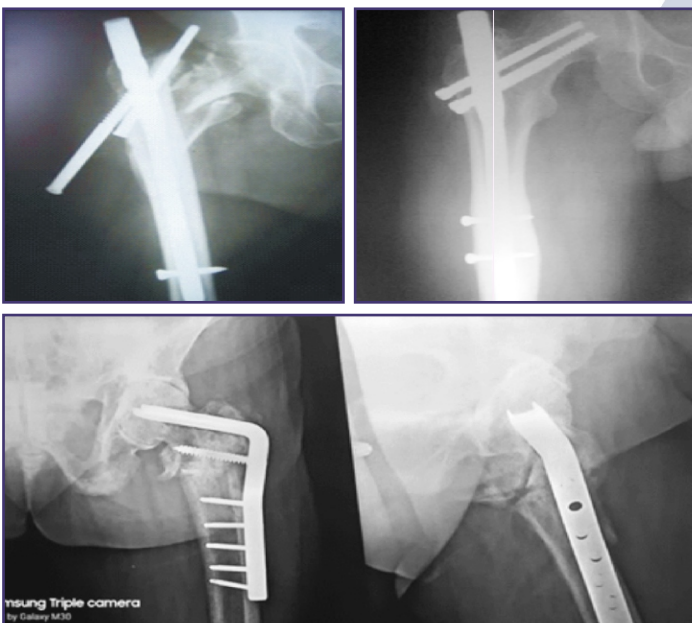


TAD or tip apex distance should be 25mm or less for nail as well as DHS and aiming for central central or central posterior implant position in head is preferred with adequate valgus neck shaft angle.



Even with nails, malreduction and gaps are not tolerated.

Complications of intertrochanteric fracture fixation include infection, implant failure and cut out, shaft fracture with short nails.



Newer concepts like augmentation of fixation with cement injection are evolving.



Some patients will benefit from replacement and immediate weight bearing mobilisation however skills needed to reconstruct are high and one needs to be meticulous to reattach the trochanters back to shaft as well as restore offset well.

Due consideration must be given in post operative phase to -

- 1) DVT prophylaxis
- 2) Mobilisation
- 3) Safety and prevention of future falls
- 4) Family counselling
- 5) Osteoporosis treatment
- 6) Support and time in the rehab protocol for successful outcome

Conclusion: Management of intertrochanteric fractures depends on a multidisciplinary approach towards the patient for successful outcome. One should fix the fracture early, reduce it well and choose correct implant for the fracture geometry. It is important to avoid technical errors, rehabilitate patients well with monitoring the progress of union and pick up impending implant failure should it occur and plan management of osteoporosis. The challenges of intertrochanteric fracture is likely to double in next two decade in Asia Pacific region especially India. All orthopaedic surgeons must have a positive team approach in treating these patients.

Recommended Reading:

- 1) Intertrochanteric Femur Fracture Treatment in Asia What We Know and What the World Can

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- 2) The Medical Orthopaedic Trauma Service: An Innovative Multidisciplinary Team Model That Decreases In-Hospital Complications in Patients With Hip Fractures, Christopher J dy, MD, J Orthop Trauma 2012;26:379383)
- 3) Pertrochanteric Fractures: Is There an Advantage to an Intramedullary Nail? A Randomized, Prospective Study of 206 Patients Comparing the Dynamic Hip Screw and Proximal Femoral Nail Marc Saudan et al, Journal of Orthopaedic Trauma Vol. 16, No. 6, pp. 386393
- 4) The Anterior and Medial Reduction of Intertrochanteric Fractures: A Simple Method to Obtain a Stable Reduction James B. Carr, MD J Orthop Trauma 2007;21:485489
- 5) Intraoperative assessment of reduction quality during nail fixation of intertrochanteric fractures Yong-Cheol Yoon a, Chang-Wug Oh b, Jae-Ang Sim c, Jong-Keon Oh, Injury 50, 2020, 400-406
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Dr. Dhaval D Desai

FRCS, MS (Orth)

Consultant Orthopaedic Surgeon

Member RET, AOTAP

Honorary Orthopaedic Surgeon, Smimer, Surat

Desai Othopaedic Centre, Surat, INDIA

Obituary

In Loving Memory



Dr. Pawan Kumar Goyal

24.11.1960 – 05.09.2020

PROSA LM – 0093

Forever Remembered, Forever Missed



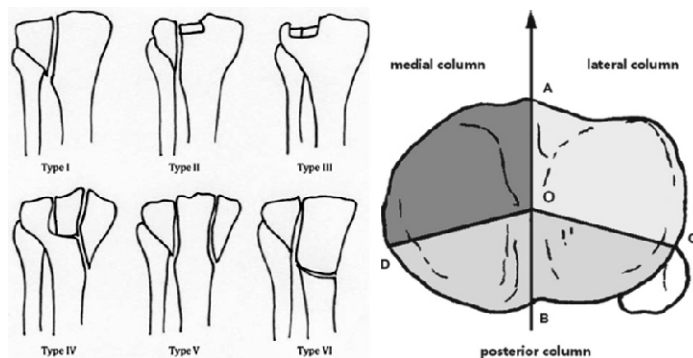
Tibial Plateau Fracture - Current Concepts in Assessment and Management.

Epidemiology: Proximal tibial fractures have bimodal distribution. High energy fractures due to road traffic accident occurs in young adults. Whereas relatively low energy osteoporotic fracture due to simple fall occurs in elderly, particularly in elderly females.¹ Proximal tibial fractures are more common in lateral condyle due to peculiar anatomy which is closely followed bicondylar fracture and medial plateau fracture respectively.²

Associated conditions: Proximal tibial fractures are usually associated with meniscal tears. Lateral meniscal tear are more commoner than medial meniscus and are usually associated with Schatzker II fractures and with greater than 10mm articular depression. Medial meniscus are most commonly associated with Schatzker type IV fractures. Proximal tibial fractures can also be associated with ACL injuries owing to ACL attachment on tibial plateau. ACL injuries are notably associated with Schatzker type IV and VI fracture.³ One should also look for devastating complications like compartment syndromes and vascular injury which are associated mainly with Schatzker type IV fracture dislocations.⁴

Classifications:

Schatzker Classification ⁵	
Type I	Lateral split fracture
Type II	Lateral Split-depressed fracture
Type III	Lateral Pure depression fracture
Type IV	Medial plateau fracture
Type V	Bicondylar fracture
Type VI	Metaphyseal-diaphyseal disassociation



Schatzker Classification	Three Column
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Three column concept⁶

Point O - enter of knee

Point A - Anterior tibial tuberosity

Point D - Posteromedial ridge of proximal tibia

Point C - Most anterior part of fibular head

Point B - Posterior sulcus of tibial plateau.

Hohl and Moore Classification of proximal tibia fracture-dislocations⁷

Type I	Coronal split fracture
Type II	Entire condylar fracture
Type III	Rim avulsion fracture of lateral plateau
Type IV	Rim compression fracture
Type V	Four-part fracture

Presentation⁸

History: The mechanism of injury determines the severity of soft tissue injury and fracture pattern observed. Medical comorbidities increase surgical risk and the incidence of wound healing complications. Extensive medical comorbidities often can preclude safe surgical intervention and non-operative management may be required.

Assessment: Tibial plateau fractures are associated high energy injuries and therefore an Advanced Trauma Life Support (ATLS) approach should be followed for initial evaluation. Once life-threatening injuries have been excluded, attention can be paid to extremity injuries. Knee should be assessed circumferentially for an open injury. The soft tissue trauma often results in oedema, local venous compromise, dermal hypoxia and additional soft tissue compromise. Soft tissue swelling, bruising and blister formation evolve rapidly over a 24-72 hour period. If there is a high energy multifragmentary fracture pattern the soft tissue envelope will need repeated assessment in order to determine the safe timing of surgical intervention. Normal wrinkling of the skin is often the best clinical indicator that it is safe to perform definitive care safely. It is of at most importance to assess for neurological and vascular injuries, as there is a risk that there has been a knee dislocation resulting in a tibial plateau fracture that has spontaneously reduced. Use of the ankle-brachial index should be adopted in cases where there is suspicion of a vascular injury and trauma CT scans with contrast may assess the vascular tree additionally. A careful examination of the lower limb motor and sensory function should be undertaken, with particular focus on common peroneal nerve function.

Compartment syndrome should be considered in all patients who sustain a tibial plateau fracture. Vascular injury is more common with Schatzker types IV patterns.

Imaging: Plain AP and lateral radiographs usually confirm the diagnosis. Additional oblique views and plateau views with 10 degree caudal tilt can be obtained for assessment of depression. CT scanning is usually

recommended for pre-operative planning in order to fully evaluate the fracture pattern and better appreciation of depression and need for bone grafting. Associated knee ligament and meniscal injuries are common in higher energy patterns. The role for MRI in the acute setting is controversial, as the natural history is unknown in the context of tibial plateau fractures.

Treatment⁸

Treatment options	Indication	Disadvantages
1. Non operative management - A. Brief period of immobilization B. Early range of motion exercise with hinged brace C. Toe touch weight bearing mobilization for 6-8 weeks	a. Low energy trauma b. Medically unfit patient c. Minimally or undisplaced fracture d. Instability of less than 10 degree in both sagittal and frontal planes e. Non ambulatory patients	a. High malunion rates b. Need for delayed arthroplasty
2. Temporary knee spanning external fixator - A. used as part of staged management B. To reduce the risk of wound complications. C. To reduce metaphyseal or diaphyseal shortening secondary to shortening	a. Open fractures b. Knee fracture dislocations c. Compartment syndrome and d. Vascular injuries	a. Pin tract infection b. Need for definitive fixation
3. Open reduction and Internal fixation -	a. Fractures associated with compartment syndrome or vascular injury. b. Joint instability of more than 10 degrees in either frontal or sagittal planes. c. Intra-articular incongruity	a. Post operative infection and wound complications
4. External fixation as definitive management - A. Hybrid external fixation B. Iliazrov technique C. Taylor spatial frame	a. All the indications needing ORIF with significant soft tissue injuries.	a. High malunion rates b. Need for delayed arthroplasty in malunions

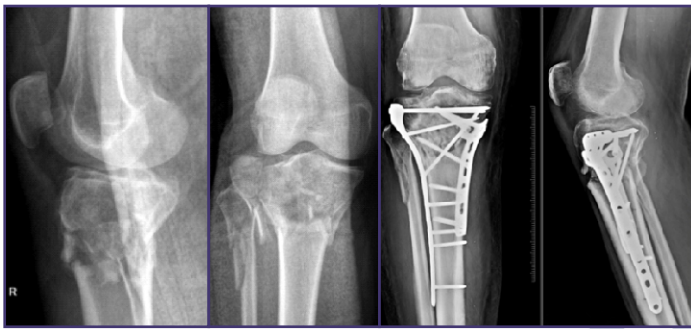
Use of bone substitutes: There is a lack of consensus regarding the use of bone graft substitutes to fill bony voids owing to its disadvantages. Disadvantages -secondary collapse of elevated fragments and donor site morbidity secondary to iliac crest autograft. The risk of infection however is not increased with their use.⁸

Surgical approaches ⁹	Indications	Complications
1. Anterolateral approach	a. Lateral tibial plateau fractures b. Bone grafting for delayed union and nonunions of tibial plateau fracture.	a. Deep branch of peroneal nerve injury due to variable course b. Damage to lateral meniscus during its detachment.
2. Posteromedial approach	a. Medial tibial plateau fractures (Schatzker type IV) b. Complex bicondylar fracture (Schatzker type V, VI)	a. Saphenous vein and nerve injury.
3. Posterolateral approach	a. Tibial plateau fractures involving posterolateral corner and requiring buttress plate	a. Common peroneal nerve injury
4. Posterior approach	a. Fractures involving posterior column. b. Repair of avulsion fractures of PCL	a. Saphenous vein and nerve injury b. Tibial artery and posterior tibial nerve injuries.

Case Examples

Case 1: 57 year old male with Schatzker type V tibial plateau fracture

Open reduction with internal fixation was done with bicolumnar plating was done



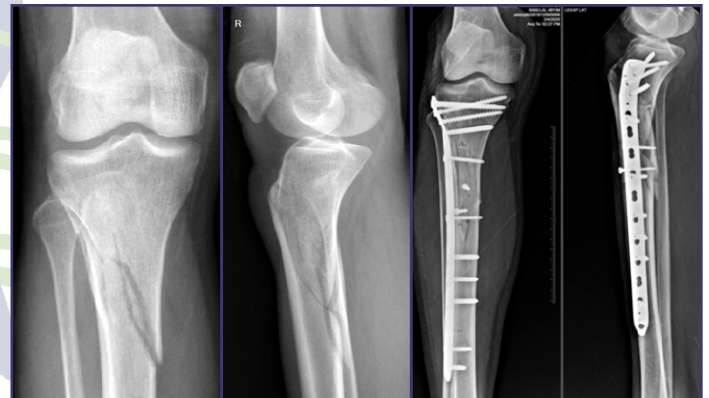
Case 2: 60 year old male with Schatzker type IV tibial plateau fracture

Open reduction with internal fixation with Posteromedial plate was done



Case 3 : 48 year old male with extra-articular proximal tibial fracture

Open reduction with internal fixation with anterolateral plate was done



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Dr Shiv Bali, Dr Sumit Banerjee

All India Institute of Medical Sciences, Jodhpur

Teacher Day Activities

Teacher's day felicitation of Prof V K Pandey & other faculty at Santokba Durlabhji Memorial Hospital Jaipur on 05.09.2020.



Distal Tibial Fracture

The management of “Distal Tibial Fracture” continues to evolve despite several dilemmas. They include; Classification - for better understanding of the fracture patterns, timing of surgery, single or two stage procedure; Approach single or double incision; Fixation nail, plate or external fixation. Also, there is a role of fibula, posterior malleolus and syndesmosis to minimize the common complications such as infection, malunion, nonunion and post-traumatic arthritis.

More commonly known as the Pilon or Plafond fractures that involve the weight bearing area of the distal tibia. They occur due to high energy axial compression forces, when the convex talar dome impacts the concave plafond of the distal tibia.¹ With plantar-flexion of the foot, most forces are directed to the dorsal (posterior) part of the articular surface and lead to the formation of a relatively large posterior fragment. However, when the foot is dorsi-flexed, the talar dome has its impact on the anterior part of the distal tibial articular surface. If the ankle is in a neutral position, usually total involvement of the articular surface is seen with a Y-type separation of anterior and posterior fragments frequently with central joint impaction.²

The incidence of distal tibial fractures is 3% to 10% of all tibial fractures or 1% of lower extremity fractures. In 70% to 85% of cases, a fibular fracture is also seen, which occurs in more complex injuries.³ Nearly 50% of patients may have additional lower extremity injuries, most often ipsilateral calcaneal or tibial fractures.

Clinical examination should specially ensure the documentation of the distal neuro-vascular status. Nearly half of distal tibial fractures are open, but significant soft-tissue injury occurs in closed fractures as well. Local swelling and fracture blisters may develop quickly and will influence the choice and timing of treatment. Compartment syndrome must always be suspected in cases with significant swelling, the appearance of fracture blisters or severe pain not responding to analgesics.⁴

Radiological evaluation includes plain radiographs and CT scanning. It has been shown that in > 80% of cases CT scans provided additional information about the fracture configuration which resulted in a change of the initially planned surgical approach in 64%.⁵

Tornetta and Gorup⁵ on the basis of CT investigations of 22 distal tibial fractures, identified six relatively common fracture fragments -

1. Anterolateral fragment (seen in 58% of cases), which is connected to the fibula by the anterior tibiofibular ligament;
2. Anterior fragment (76%);
3. Medial malleolar fragment (84%) may still be connected to the anterior or posterior fragment and may include up to 40% of the tibial articular surface;
4. Posterior fragment;
5. Posterolateral fragment (26%);
6. Central fragment (50%) is located in the central articular surface and is not connected to other fragments by ligaments and may comprise up to 20% of articular surface.

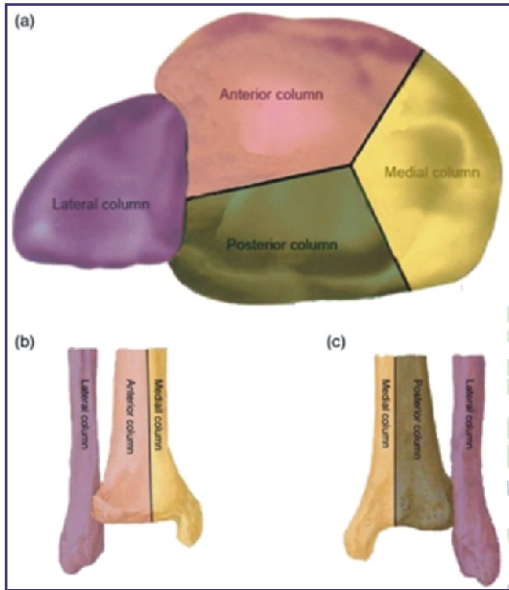
With the fracture mapping technique Cole et al⁶ revealed the common fracture lines that typically define a Y-shaped fracture pattern with the three most common fragments seen - medial, anterolateral and posterolateral.

Rüedi and Allgöwer classification and AO/OTA fracture classification are used most often⁷. The AO/OTA fracture classification distinguishes extra-articular (type A), partial articular (type B) and complete articular (type C) fractures. All intra-articular fractures (types B and C) can be defined as pilon fractures. These two systems are all-inclusive and have a good prognostic value, but they cannot provide accurate information on fracture morphology for surgical planning.

For practical reasons the subdivision of distal tibia into three basic columns is very helpful.⁸ The medial column is the continuation of the medial side of tibia shaft and includes the medial part of articular surface and the medial malleolus. The lateral column is the prolongation of the anterolateral side of tibia shaft and contains the anterolateral part of the articular surface of the plafond, the Tillaux-Chaput tubercle and the incisure for the fibula. The posterior column is the continuation of posterior surface of the tibia and ends in the posterior malleolus. The surgical approach to the pilon fracture should be chosen according to the location of the articular injury (involved column) and appropriate mechanical fixation needed for stability.

The four-column classification was first introduced by Tang et al⁹ who viewed fractures in the lateral part of the distal tibia plafond and the fibula as lateral-column

fractures. However, the lateral part of the distal tibia plafond and the fibula were separately restored and fixed in comminuted pilon fractures. It is more reasonable to view the fibula as a single column. Thus, this new four-column theory provides reliable and effective prognoses for surgical treatment of AO/OTA type 43-C3.3 pilon fractures.



Multi-fragmentary intra-articular fractures of the distal tibia (classical pilon fractures), the depressed articular fragments have no soft-tissue attachments and cannot be reduced by indirect closed means (ligamentotaxis) and require direct open reduction.

The classical approach to ORIF of distal tibial fractures was proposed by Rüedi and Allgöwer⁷ in 1969 and includes these four surgical steps:

1. Reduction and fixation of the fibula;
2. Reconstruction of the articular surface of the tibia;
3. Bone grafting of depressed articular and metaphyseal defects;
4. Fixation of the metaphysis to the diaphysis with a medial plate.

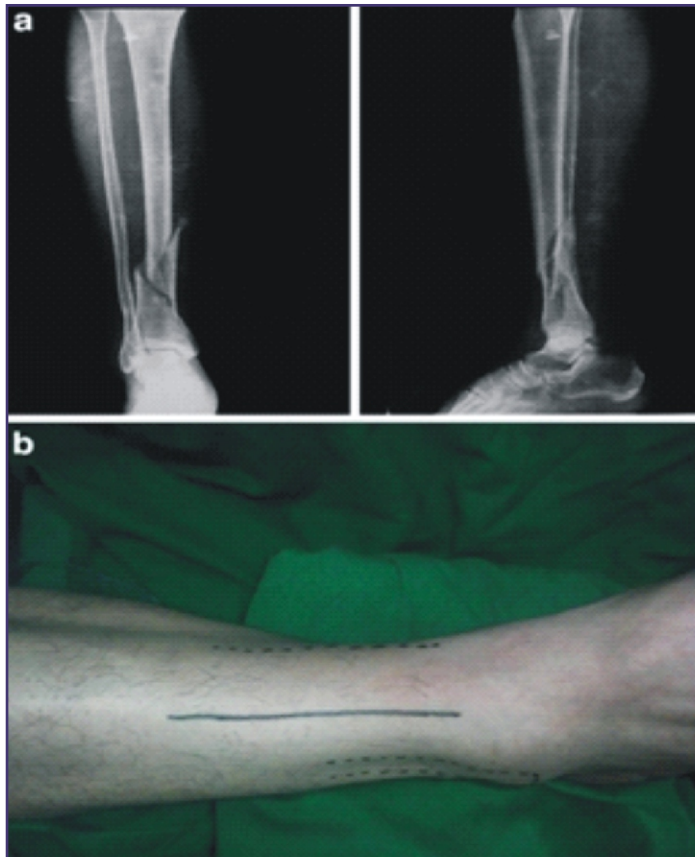
In high-energy fractures, the number of complications appeared to be much higher. Dillin and Slabaugh¹⁰ reported a 55% incidence of wound complications and Teeny and Wiss¹¹ reported a 37% incidence in their series. This high number of wound complications was related to poor local soft-tissue conditions at the time of surgery. At the end of the 1990s, a staged protocol for the treatment of distal tibial fractures was proposed by several authors.^{12,13} The first stage included fixation of the fibula and application of an external fixator medially. Definitive distal tibial fixation was performed only after the resolution of soft-tissue oedema, usually 7 to 14 days (or more) after the injury.

This is indicated by resolution of any fracture blisters and appearance of wrinkling of the skin.

There are two main configurations of external fixator for temporary joint-bridging ankle fixation. A unilateral, medial fixator may be used after initial fibular fixation and consists of two Schanz-pins in the proximal antero-medial tibia and a Schanz pin in the medial calcaneal tuberosity and another pin in the first metatarsal bone distally to help maintain the foot in a plantigrade position. In some cases, when lateral support is not provided by fixation of the fibula, a medially placed external fixator may be insufficient to prevent valgus displacement and lateralisation. In these cases, a Denhem pin is inserted through the calcaneal tuberosity and secured to two half pins in the tibia. The forefoot may be stabilised and positioned with smaller diameter pins. This construct provides equal distribution of traction forces to both medial and lateral sides.

The extensile antero-medial approach was the most commonly used for the reconstruction of pilon fractures. It provides an excellent view of the medial column and anterior part of the plafond, but the possibilities for the restoration and fixation of lateral column and Tillaux-Chaput tubercle are somewhat limited. It has also been associated with a very high percentage of soft tissue complications. The antero-lateral approach allows direct visualisation of the lateral column and anterior part of the joint, but does not provide access to the medial column. When a lateral column fracture is associated with a fibular fracture, the reduction and fixation of both can frequently be achieved through a single antero-lateral approach. Soft tissues on this side of the joint are less vulnerable compared with the medial side.¹⁴ All anterior approaches rely on the assumption that the postero-lateral fragment is anatomically reduced to the tibia by reduction and fixation of the fibula. Once this postero-lateral fragment is reduced it becomes the 'stable and constant fragment' to which and around which the adjacent fragments are reduced and fixed. When planning surgical approaches, one has to remember that the skin bridge between the two incisions (if used) should be wide enough to maintain the blood supply of the soft tissues. It was empirically postulated that for safe skin blood supply the width of the bridge should be at least 7 cm. The use of more limited approaches (minimally invasive osteosynthesis or minimally invasive plate osteosynthesis (MIPO)) or the delay of surgery until the soft tissues have recovered enough may allow the width of the skin bridge to be reduced to 5 cm to 6 cm safely with low complication rates.¹⁵

In 2000, Shantharam et al.¹⁶ proposed the single-incision treatment for the management of these fractures, and reported a good clinical efficacy. A longitudinal anterolateral incision is made on the skin and subcutaneous tissues on the distal leg along the projection line of the extensor digitorum longus muscle between the tibia and fibula; the incision was centered on the fracture. The distal end of the incision can generally be extended to about 2 cm above the tibial articular surface without exposure of the subtalar joint. The proximal end of the incision can also be further extended depending on the nature of the fibular fracture. Following identification of the anatomic structures and blunt dissection, the fibula fracture is first to be exposed and fixed so as to get the length reference of the tibia. This is followed by lateral retraction of extensor hallucis longus (EHL) muscle, EDL, the anterior tibial vein and artery, and the deep fibular nerve together and the tibialis anterior muscle being retracted medially to expose the distal tibia. When reduction of the tibial fracture is achieved, a plate is then applied on the lateral aspect of the tibia for fixation. In a few cases, depending on the fracture type, a buttress plate can be inserted percutaneously on the medial aspect of the leg following reduction. In situations of defect created by the reduction of the fracture fragments in comminuted distal tibial fractures, bone grafts or bone substitute is inserted to fill the void before plate application and fixation.



Correct reduction of the fibula with restoration of length, rotation and axial alignment not only provides a reference for reconstruction of the distal tibia, but may also facilitate partial reduction of the anterolateral and/or posterolateral fragments as a result of the usually intact syndesmotic ligaments (ligamentotaxis). In cases of a simple fibular fracture with varus deformation of the tibia, a one-third tubular plate that functions as a tension-band plate is effective for fixation. In comminuted fractures of the fibula or valgus angulation of the distal tibia, more rigid implants are preferred. In transverse fractures, intramedullary fixation may be considered as a less invasive method of fracture fixation.

Besides the correct choice of surgical exposure, distraction (either with an external fixator or a femoral distractor) provides great help in facilitating surgical reduction. It is possible to use unilateral (uniplanar) distraction with Schanz-pins or bilateral distraction with Denhem pin. This last one is extremely useful when the fibula is not fixed or stabilised.

It is important to keep in mind that placement of a pin through the calcaneus (in the tuberosity, posterior to the tibia plane) will cause dorsal extension of the ankle and may hinder the joint visualisation from an anterior approach. However, placement of a Schanz pin in the talar neck can be used to provide plantar flexion of the foot and provide better visualisation of the anterior joint.

The posterolateral fragment is a 'key fragment' for the reconstruction of the distal tibia articular surface. It may be reduced spontaneously by fixation of the fibula relying on ligamentotaxis, but in approximately 20% of cases, direct reduction is needed. Reduction through a separate posterolateral or posteromedial approach may be the most accurate, but requires separate procedures and special patient positioning (prone or lateral decubitus).

Autologous bone grafting is recommended as a standard procedure for filling these voids and supporting

the articular fragments.⁷ In some cases, introduction of locked plates and bone substitutes has reduced the need for autologous bone grafting.¹⁷

The use of minimally invasive plate fixation at this stage may allow the surgeon to limit the length of the surgical incision and maximise the preservation of blood supply to the metaphyseal bone and soft tissues. Use of locking plates has advantages primarily in osteoporotic bone and comminuted, short peri-articular segments, common in pilon fractures. Axial alignment is easily assessed with intra-operative radiograph controls but torsion is best assessed clinically.¹⁸

Medial plate positioning was preferred historically,⁷ but biomechanical testing showed no differences in stiffness in compression and torsion between anterolateral and medial locking plate constructs.¹⁹ The choice between medial or anterolateral plates should be determined mainly by the soft-tissue condition and failure mode of the fracture configuration.

ORIF/MIPPO remains the procedure of choice for treating intra-articular fractures of the distal tibia. Reported results have improved during the last decades due to a better understanding of the role of soft tissues in these fractures. The range of wound complications varies from 3% to 14%, with deep infection in the range of 2% to 4.8% and for nonunions 0% to 9%.²⁰ Both the IMN and PL internal fixation methods are effective for the treatment of distal tibial fractures with metaphyseal involvement. However, knee pain and malunion are more frequent with IMN fixation, and the risk of superficial wound infection is higher in PL internal fixation.²¹

The use of bridging external fixation has been shown to be accompanied by a high level of long-term complications, including nonunion in about 7% and malunion in up to 13.5%. Some authors have postulated that the use of bridging external fixation as a definitive treatment is one of the predictive factors of poor result.²² Thin-wire fixation as hybrid fixation or Ilizarov frame fixation have some advantages over joint-bridging fixation. They may be applied, in selected cases, in combination with limited open or closed internal fixation directly in the acute setting as a one-stage treatment without waiting time for the soft-tissue insult to resolve. Wound complications are less frequent, but pin-track infection becomes the main problem.

The surgical approach specifically pertaining to the management of distal syndesmosis injuries in rotationally unstable ankle fractures continues to evolve. This is due

to the realization that the rate of syndesmosis malreduction has been unacceptably high in the past.²³ Disruption of the distal tibiofibular syndesmosis occurs either through fractures of the posterior malleolus or Chaput tubercle or rupture of the syndesmotic ligaments (posterior inferior tibiofibular ligament [PITFL], anterior inferior tibiofibular ligament [AITFL], interosseous ligament and interosseous membrane). In the conventional approach, open anatomical reduction and stable internal fixation of the lateral and medial malleoli are first performed. This is normally followed by an intraoperative Cotton test to evaluate the integrity of the syndesmosis. An increase in medial tibiotalar clear space and/or an increase in tibiofibular clear space and decrease in tibiofibular overlap on fluoroscopy demonstrates syndesmosis instability. If the test is positive, the fibula is reduced into the incisura usually under fluoroscopic control without direct visualization, held with a large pointed reduction forceps, and fixed with a trans-syndesmotic position screw or suture-button device to restore stability for correct healing of the ruptured ligaments. The posterior malleolar fracture with its intact attached PITFL as a crucial component of the syndesmosis injury, and overemphasizes it as purely an intra-articular fracture. There is no evidence that supports the fixation of only large fragments, such as those > 20% of the articular surface. Fixing the posterior malleolus not only restores tibiotalar congruity but also ankle rotational stability. The focus of the anatomical approach is on direct stabilization of the syndesmosis achieved through anatomical fixation of medial malleolar, posterior malleolar and Chaput fractures, and repair of the deltoid ligament if it is ruptured. The PITFL is usually avulsed at its tibial insertion in the form of a broad periosteal sleeve that is amenable to direct repair using a screw with a large washer. As the PITFL is the main ligamentous stabilizer of the syndesmosis, it is vital to address this injury. In comparison, the AITFL plays a lesser role in stabilizing the syndesmosis and frequently does not require anatomical repair, particularly since in a significant proportion of cases the stability of the syndesmosis would have been restored (Cotton test negative) after the PITFL avulsion has been addressed. Moreover, primary suture repair of the AITFL is technically difficult due to shredding of the fibres.

The treatment of intra-articular distal tibial fractures (pilon fractures) remains challenging for orthopaedic surgeons. Complex fracture anatomy and delicate soft tissues in the region make surgical treatment risky and

complicated. As in other articular fractures, anatomical reconstruction of the joint surface, stable fixation of the articular fragments as well as respect for the soft tissues with early functional aftercare are needed to maximise good results. Staged treatment of these injuries allows soft tissues to recover from the initial injury and makes subsequent surgical treatment safer. Other improvements are associated with precise pre-operative diagnostics (CT) and careful planning of surgical approaches according to the fracture morphology. Atraumatic soft-tissue handling and the use of modern fixation techniques for the metaphyseal component (MIPO) further facilitate healing. Last, but not least, improvements in implant design (low-profile locking plates) also play a significant role in the treatment of these severe fractures.²⁴

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Dr Jayant Sen

Hon. Consultant

Santokba Durlabhji Memorial Hospital, Jaipur

IOA Benevolent Fund Support

*R*OSA has lost one of the senior most members of the fraternity and the most respected Dr Pawan Kumar Goyal on 05.09.2020 due to COVID-19.

ROSA is thankful to IOA Office bearers specially President Dr R.C. Meena & Dr. Sandeep Kumar for accepting the request for one time help from IOA benevolent fund to spouse of Late Dr Pawan Kumar Goyal (LM 04040).

ROSA received a cheque of Rs 200000/- and with folded hands it was handed over to Mrs Goyal by IOA president Dr RC Meena in presence of Dr Mahesh Bansal HOD SMS medical college, Dr RL Dayma, Dr Jayant Sen & Dr Rahul Katta, Hon. Secretary, ROSA.



Talus-the Giant in Vascular Compromised Bones: Let's Keep It Fixed

Talus got its name from middle French that says “heap of rock that supports the cliff”, and old Latin “*talutium* slope indicating presence of gold under the soil”. Both explain the idea behind, it being an important support structure of the body, driving force that transfers weight from leg to foot and still largely ignored in general orthopaedic practice like gold hidden in the soil.

Talus is the 2nd largest tarsal bone with 5 articular surfaces and all of them have a role in weight bearing. Two third of talus is covered by articular cartilage. Like its high residing sibling, Scaphoid, no muscles or tendons insert or originate from talus yet it brings all the movement around ankle joint.

Talus has 3 parts- the head, Neck and body and two processes- lateral and posterior. Head articulates with navicular whereas body forms a part of ankle and subtalar joint. Neck joins body and head and rest over sinus tarsi. It does not articulate with ankle.

Unlike older reports that indicate poor vascular flow, there is extensive extraosseous and intraosseous blood supply to talus, but since no muscles originate or insert into the talus and most is covered by articular cartilage, areas available for vessel to enter are few. Mainly branches from posterior tibial, dorsalis pedis/anterior tibial artery and peroneal arteries supply the talus.

The aim is to identify, understand the injury sustained to this vital bone and apply the best principles in management of the injury to give best outcome and quality of life to the patient. Each fracture type presents with its unique set of challenges and are addressed accordingly.

Fracture of the Talar head: Incidence is less than 10% of all Talar fractures and uncommon to occur as isolated injury. Mostly associated with complex neck and/or body fractures or as a part of complex Chopart fracture dislocation. Disability results from involvement of articular surface and development of post traumatic arthritis of Talo-Navicular joint.

Mostly they are either **compression** or **shear** fractures. After clinical and radiographical assessment the treatment plan is formulated. Nondisplaced fractures can be treated with below knee cast(non-weight bearing) for 4 weeks followed by progressive weight bearing. A displaced fracture is to be treated with ORIF aiming to

restore articular surface, length and alignment of medial and lateral columns.

Tips and tricks: Pre-op CT scan to localise the fragment and fracture geometry. Take longitudinal medial or dorsal approach depending on the position of fragment. If fragment is collapsed, use a distractor between Cuneiform and Talar head and expand joint space to give better access to the fracture site and fragment. Mini (2.7mm)headless screws are better for fixation. If the fracture is not reconstructable, a primary TN arthrodesis is recommended.

Talar Neck Fractures: These account for 50% of all major talus injuries. Neck fractures and fracture dislocations are associated with high frequency and severity of complications ranging from painful restriction of ankle movement, infection and soft tissue complications, non-union, malunion, post traumatic arthritis and AVN. Hawkins classification is the most widely used that explains the injury pattern, guiding the treatment and prognostic value. Radiographic evaluation is the first step that includes X-rays including Canale view, CT scan with 1-2mm cuts. MRI is helpful with type I undisplaced fracture with osteochondral injury that might be missed in routine x-rays. Non operative treatment is strictly reserved for truly undisplaced type I fractures with 4 to 6 weeks of immobilization in below knee cast and non-weight bearing mobilization for 6 to 8 weeks or till radiological sign of union .

With any displacement of fracture no matter how minimal, consider type II injury or ahead with subtalar subluxation or dislocation. Type II, III and IV injury needs intervention in the form of either closed or open reduction and fixation but end result should be absolute anatomical reduction. The open approach to the talus could be lateral, medial or a dual approach depending on fracture configuration and need for exposure.

Challenges faced in Talar neck fracture are mainly:

Dorsomedial comminution

Screw placement : The comminution makes it difficult to assess the length of talus and rotational orientation. A dual approach with standard medial and a straight lateral incision is very helpful in this. With a lateral incision, both sides can be visualised. This prevents over compression of the medial side and varus

orientation of talus. After achieving reduction, temporary fixation can be achieved with K wires. Insert a lateral screw first and achieve compression under vision. Medial side should be fixed later and in view of dorsomedial comminution, a mini plate is more suitable to achieve correct length and rotation and prevent over compression.

The direction of screw placement is depends on approach and ease of placement. Both antero-posterior or postero-anterior screws gives good compression as long as they are perpendicular to the fracture line.

Tips and tricks :

- Use approaches sparing the vascular supply and use small fixators or distractors to restore length and alignment prior to fixation.
- Simultaneous medial and lateral approaches are better to assess reduction on both sides.
- Start with anterolateral approach In line with 4th ray of foot.
- Visualize lateral dome of talus, lateral process of talus, lateral talar neck, lateral talar head and talofibular articulation.
- Localise medial incision with elevator and mark it.
- Take anteromedial approach on marked incision and make plane between anterior and posterior tibial tendons.
- Visualize medial talar dome, medial talar neck and talar head.
- Plan medial incision to allow for medial malleolar osteotomy if needed.
- Use cortical interdigitations for reduction, always of lateral and inferomedial side as dorsomedial compaction may be misleading.
- If fractures is vertical neck through anterior chondral surface, chondral interdigitations provide excellent assessment of reduction.
- A through and through K wire engaging the distal fragment can be used as joystick manipulation and helps in reduction.
- Check AP and lateral images on image intensifier.
- Avoid varus malreduction on AP view and extension malreduction deformity on lateral view.
- In high energy trauma, excessive dorsal comminution and impaction may need strut graft to restore Talar-first metatarsal angle which should be nearly parallel on both AP and lateral view.
- Check for any lateral process fracture if any incongruity is visible on radiographs. If present then it should be reduced and fixed using 2.7mm headless screw or 2mm T plate. If fracture is multi-

fragmentary, K wires are used to fix , cut and bent as definitive fixation.

- **Countersink** the screw head into the chondral surface. **Abduct the foot at talonavicular joint** to get more access to medial chondral surface on Talar head.
- **Circumferential comminution** is a difficult problem to address. Small external fixator from distal medial tibia to medial navicular and from fibula to lateral navicular can be applied. This helps to achieve restoration of talar neck length and angulation.

Tips and tricks: Extruded Talar body reduction

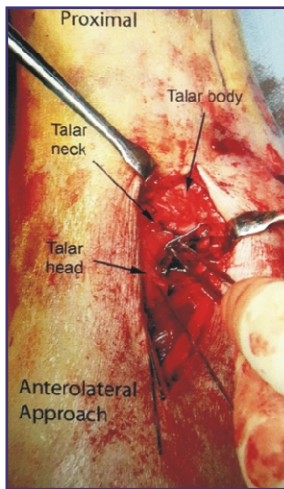
- Typically Talar body is extruded postero-medially into the tarsal tunnel around neurovascular structures and posterior tibial tendon which hinders the spontaneous and closed reduction of the body.
- Attempt in emergency to get closed reduction under sedation.
- Flex the knee to relax gastrocnemius
- Apply longitudinal traction to calcaneus with countertraction being applied by assistant to distal femur.
- Get valgus angulation of calcaneus
- Apply direct pressure over the extruded body into mortice.
- **If failure of closed reduction:** apply external fixator to create adequate space for reduction.
- 1 transcalcaneal pin and 2 distal tibial pins (medial and lateral)
- Open ended compression distraction device to create distraction enough for talar body to reduce.
- **If it still fails to reduce:** With fixator in situ, use dual approach(anteromedial and anterolateral)
- Remove all entrapped soft tissue, release tibialis posterior sheath if needed and get direct manipulation of talar body to achieve reduction. A 2mm K wire can be used in articular surface of body and manipulate for reduction.
- **When even this does not work:** Do a medial malleolus osteotomy.

Tips and tricks: Preventing varus collapse

- Plating (either on medial or lateral talar neck) can prevent varus.
- Lateral side is easier to apply plate on
- Use 2.0 or 2.4mm plate and pre-bend to around 50-70 degree to fit into extra-articular surface of talar neck.
- Medial plate is difficult as less space is available. Use

a 2.0mm straight plate.

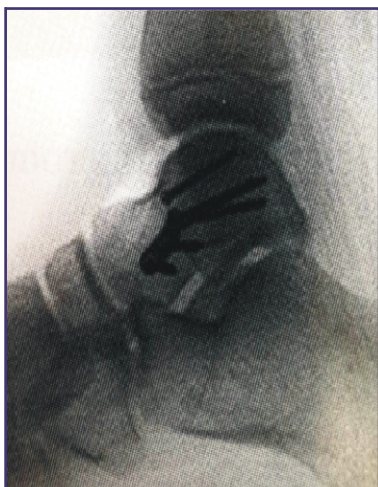
- Invert the foot to maximum to determine the limit of plate placement as it should not impinge on medial malleolus.



Application of Lateral Plate



Fluoroscopic Image of Implant Position



Lateral View of Talar Neck Fracture Fixed With Plate and Screw

Talar Body Fracture: Body accounts for 15-20 %

of all talar injuries and often in association with neck fractures. These are true intra-articular fractures involving both tibiotalar and subtalar joint. So persistent displacement of these fractures may lead to joint incongruity, blocked dorsiflexion and if untreated or treated inadequately may lead to severe hindfoot arthritis, malalignment and limitations of ankle ROM.

This typically occurs with high energy axial compression (Fall from height or RTA).

Goal : Restoration of articular surface of talar dome (tibiotalar joint) and posterior facet (subtalar joint), prevent infection and AVN

Non-operative treatment is reserved for truly undisplaced fractures. These patients can be treated with below knee non weight bearing cast for 6-8 weeks followed by mobilization once radiological signs of healing are visible.

Most need definitive fixation once the skin condition is permissible for the surgery. The approach could be

- Anteromedial and anterolateral
- Posteromedial if needed

This could pose a great deal of difficulty in both approach as well as fixation.

Tips and tricks:

- CT scan is must to determine the best approach, location of major fracture line and need for medial or lateral malleolus osteotomy to get best visualisation and fixation.
- Use a small fixator/distractor if needed to improve visualisation.
- Posterior facet fragments are mostly found impacted into the cancellous surface of talus body and may cause difficulty in reduction of larger fragments. Always identify and reduce these impacted fragments first.
- Multiple mini screws used for definitive fixation (mostly 2.4 and 2.7mm headless screws).
- Keep 1.5mm and 2mm screws ready for smaller fragments if needed.





Posteromedial Talus Fracture (Cedell Fracture):

Bearing the name of the person who described this injury pattern first, these are uncommon fractures. This usually occurs after pronation injury to the foot causing avulsion of posteromedial process. Careful radiological examination including CT scan is mandatory. The treatment of this has come long way from being left alone to absolute reduction and fixation. In general.

- If the fracture fragment is small and does not interfere with ankle or subtalar motion, a below knee cast for 6 weeks is advised. If pain and swelling persist even after 6 months then excision of fragment should be done through posteromedial arthrotomy.
- If fragment is large and interferes with ankle and subtalar ROM, ORIF is advised.

Tips and tricks :

- Place the patient in prone position.
- Posteromedial approach is ideal.
- Distractor with pin in distal tibia and medial posterior tuberosity of calcaneum for better visualisation.
- Apart from standard approach between achilles tendon retracted laterally and deep posterior compartment medially, be prepared to explore between FHL and neurovascular bundle for best exposure.
- Assess the subtalar joint first and if any impaction is seen then disimpact it with a narrow osteotome and hold with a K-wire. Reduce other intercalary fragments and fix with K-wires and finally fix large fragments.
- Use 2.0 mm or 2.4 mm headless screws or bury the head
- If the fragment is large, small 2.0mm T plate can also be used.

Lateral Process Fracture (Snowboarder's Fracture): Very often these fractures are misdiagnosed as ankle sprains and lead to long term pain and disability to the patient without adequate treatment. Therefore it is vital to have high index of suspicion and identify this injury to provide treatment and achieve acceptable

outcome. Account for around 24% of all Fractures of talar body but isolated one is relatively rare.

Axial loading in combination with excessive dorsiflexion and eversion of foot results in lateral process of talus fractures.

Patients present with pain localised over lateral aspect of ankle, distal to lateral malleolus. Around 59% of these injuries are missed on initial assessment.

Radiological assessment includes Broden's view along with standard x-rays and CT scan.

Small and minimally displaced fragments can be treated with below knee cast immobilisation for 6 weeks. But for larger fragments ORIF is advisable. If there is severe comminution which is not amenable to reconstruction, then excision of the fragments should be done.

Tips and tricks:

- use a transverse incision from distal tip of fibula and extend anteriorly 2-3 cm.
- lateral process is directly visualised
- reduce and fix with 2.4mm or 2.7mm headless screw
- alternatively a 2mm plate with 4 holes can also be used with both end holes cut to form a hook and central 2 holes for 2.4mm screw.

Posterolateral Talus Fracture: Two common mechanisms for this injury are:

- (a) Forced plantar flexion causing direct impingement of posterior tibial plafond on posterolateral process
- (b) Excessive dorsiflexion of ankle causing tension in posterior talofibular ligament avulsing the posterolateral tubercle.

There is history of sudden uncontrolled injury to the foot, pain and swelling in posterior aspect of ankle. Pain that aggravates on attempting to squat on a plantar flex foot should raise suspicion of posterior process fracture.

Routine lateral X-ray of ankle is able to identify the injury and can be supported with CT scan in doubtful cases.

For small undisplaced fractures, conservative treatment in below knee cast for 4 6 weeks is recommended.

Small displaced fragments can be excised. If fragment is large with piece from Talar body then ORIF is recommended.

Tips and tricks:

- Prone position is ideal

- Posterolateral approach directly lateral to achilles tendon, avoid the tendon sheath.
- Stay medial to sural nerve.
- Distractor can be used and is helpful to improve visualisation.
- Put a pin into fibula, other into calcaneal tuberosity from lateral to medial.
- Dorsiflex the ankle and apply a bar to provide distraction.
- Incise the capsule to get a direct access to both Subtalar and Tibiotalar joint.
- Use a 2.7mm screw or small plate depending on fragment size.

Conclusion: Talus being the driving force of ankle joint requires the best suited approach for the optimal outcome. Still the complication rates are high depending on the fracture pattern, mechanism of injury. The most concerning ones are:

- (a) Skin necrosis
- (b) Avascular necrosis
- (c) Delayed union and non-union of talar Neck
- (d) Malunion of the talar Neck
- (e) Infection and osteomyelitis
- (f) Post-traumatic arthritis
- (g) Arthrofibrosis

Most of them can be avoided by choosing the right time and approach, meticulous soft tissue handling, anatomical reduction and fixation with appropriate implants. However, good preoperative counselling explaining the nature of fracture, likely outcome despite best efforts along with the complications is essential and should be well documented. Getting oneself oriented with the three dimensional anatomy of talus before stepping into the operating room can help in achieving the desired goal and providing best surgical outcome for the surgeon and functional outcome for the patient.

Dr Rahul Upadhyay

Consultant Orthopaedics and
Foot and Ankle Surgeon

Mahavir Jaipuria Rajasthan Hospital, Jaipur

An Oasis of Tranquility

Ladakh is a desert unlike any other. The high-altitude rugged landscape deters many a visitor especially those with heart and joint ailments. But the lucky ones able to endure the harsh conditions are blessed with the beauty of nature that is unique and astounding. The whole region is picturesque and rewards you with amazing vistas but the crowning glory is the Pangong Lake.

A veritable oasis in the cold desert, Pangong lake offers unparalleled views. Amidst the cold, rocky surroundings this magnificent expanse of clear turquoise water is refreshing and calming to all visitors. The site for many a magical moment on celluloid, it is even more alluring than any photograph or video you might have seen of it.

As a casual photographer I have captured many a shot of landscapes. Most such shots require varying amounts of setting up and technical tricks to render them memorable. Not so with the Pangong lake, its beauty needs no augmentation, every shot you take is filled with the immersive splendor of the place.



The Ladakh region is a must visit for everyone fit enough to make the travel. Its unique landscape and culture make it an awe-inspiring and soul-enriching experience. It is a pity that such a serene and awesome land is at the centre of human transgressions and political wars. A series of flare-ups and military buildup on either side of the border threatens to destroy this marvelous place and endanger its lovely hospitable inhabitants. I sincerely hope that the prevailing tensions in the area resolve quickly so that all Indians and foreign tourists can once again travel there and take-in the beauty of nature at its best.

Dr Mukesh Garg

Mid Term ROSACON 2020

*R*OSA has made a history by organising first ever virtual midterm ROSACON 2020 on Sunday, 12th July 2020 with the aim of involving maximum members from state as faculty, panellists, moderator & chairpersons and to dissipate knowledge of various subspecialties for ROSA members.

It was First virtual webinar with 13 sessions of all subspecialty & first webinar to get 2 CME credit hours from medical council. There were well deserved national & international faculty as experts, platform provided for young orthopaedic surgeons to showcase their work & discuss with eminent faculty. Virtual inauguration was done by IOA President and President Elect. There were different moderators for each session, Dr S.B. Solanki and Dr Saurabh Mathur were convenors and Dr Jayant Sen was scientific chairman for this event. More than 580 delegates registered for this conference across the globe and there were more than 1800 viewers.

PG quiz for Dr GirijaNath - Leela Sen Gold Medal was also organised virtually during this conference.



RAJASTHAN ORTHOPAEDIC SURGEON'S ASSOCIATION

SAVE THE DATE

MID TERM ROSACON 2020

Virtual Conference

Sunday 12th July, 2020

Time: 09:00 AM - Onwards

Online Registration Link: <http://tiny.cc/midtermrosaon2020>

Galaxy of Eminent Guest Faculty

Organising Team

Org. Secretary: **Dr. Rahul Katta**
Secretary, ROSA

Org. Chairmen: **Dr. Rajesh Goel**
President, ROSA

Scientific Chairman: **Dr. Jayant Sen**

Convenors: **Dr. S.B. Solanki & Dr. Saurabh Mathur**

RAJASTHAN ORTHOPAEDIC SURGEON'S ASSOCIATION

MID TERM ROSACON 2020

Virtual Conference

Sunday 12th July, 2020

Time: 09:00 AM - Onwards

"Discover the new trends of Knowledge, Wisdom & Excellence in orthopaedics"

Scientific Agenda

09:00 am - 09:30 am: REGISTRATION, waiting room- tutorial
09:30am - 10:00 am: INAUGURATION

HALL - A

- Session- 1 Time: 10.00 am to 10.45 am Arthroscopy: Hip
- Session- 2 Time: 10.45 am to 11.30 am Arthroscopy: Knee
- Session- 3 Time: 11.30 am to 12.15 pm Trauma- Acetabulum
- Session- 4 Time: 12.15 pm to 01.00 pm Trauma - Shoulder
- Session- 5 Time: 01.30 pm to 02.15 pm Hand
- Session- 6 Time: 02.15 pm to 03.00 pm Spine

HALL - B

- Session- 1 Time: 10.00 am to 10.45 am Arthroplasty: Knee
- Session- 2 Time: 10.45 am to 11.30 am Arthroscopy: Shoulder
- Session- 3 Time: 11.30 am to 12.15 pm Trauma: Knee & Ankle
- Session- 4 Time: 12.15 pm to 01.00 pm Trauma: Elbow & Wrist
- Session- 5 Time: 01.30 pm to 02.15 pm Paediatric: Fractures
- Session- 6 Time: 02.15 pm to 03.00 pm Peri-implant Infections

HALL - C

- 01.00 to 02.00 pm PG QUIZ
- 03.00 pm: Closing ceremony/Valedictory

for Online Registration:- <http://tiny.cc/midtermrosaon2020>

Bone & Joint Week Activities

Bone and Joint week was celebrated from 1st to 7th August 2020. Theme for this year was “Prevention of deformity in degenerative diseases.” Various activities were organised even in difficult time of COVID 19 pandemic.

Bone and Joint day Poster / Sticker and Banner were released by IOA president Dr. R.C. Meena in a press conference at SMS Hospital and these were sent by Hon. Secretary ROSA Dr Rahul Katta to all city chapter/regional chapter of ROSA.



INDIAN ORTHOPAEDIC ASSOCIATION

BONE & JOINT DAY

4th August 2020

IOA PRESIDENT'S THEME FOR 2020 :
PREVENTION OF DEFORMITY IN DEGENERATIVE DISEASE

WEEK long activities 1-8-2020 to 07-08-2020

TIPS FOR PREVENTION OF DEFORMITY IN DEGENERATIVE DISEASE

<p>Maintain ideal weight (BMI 18 to 25)</p>	<p>Regular weight bearing Exercise</p>	<p>Healthy Diet with adequate intake of Calcium & Vitamin D</p>
<p>Improve muscle strength</p>	<p>Avoid overuse and misuse</p>	<p>Correction of Malalignment of Legs</p>
<p>Use appropriate braces</p>	<p>Avoid injury</p>	<p>Consult the Doctor early</p>

Issued In Public Interest By Indian Orthopaedic Association & Rajasthan Orthopaedic Surgeon's Association

Prof. R.C. MEENA President, IOA	WEEK long activities 1-8-2020 to 07-08-2020	Dr. ATUL SRIVASTAVA Hon. Secretary, IOA
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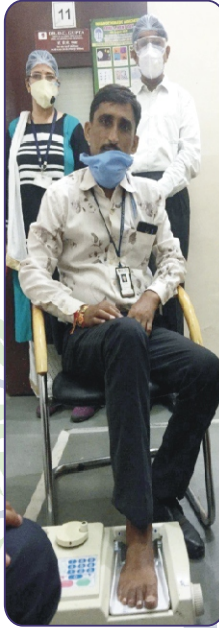
<ul style="list-style-type: none"> ★ Virtual Health Education Lectures ★ Distribution of Pamphlets ★ Display of Posters 	<ul style="list-style-type: none"> ★ Radio and TV Coverage ★ Print Media Coverage ★ Social Media Coverage ★ Any other Unique Program
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Dr. S. RAMESH BABU Chairman, CSRC	Dr. JAYANT SEN Member, CSRC	Dr. RAMESH C. BANSHIWAL Member, CSRC	Dr. RAJESH GOEL President, ROSA	Dr. RAHUL KATTA Hon. Secretary, ROSA
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Jaipur Region

Free consultation camps, BMD camps and various other public awareness activities were organised at SDM hospital, SMS Hospital, Khandaka Hospital, Metro Mass Hospital. Goyal Hospital organised a Virtual Talk Show: Jeewan ki Tisari Pari. Various members also put banners and posters at their centre and spread awareness about care for degenerative diseases of bone & joints.



अस्थि रोगों के लिए जन जागरूकता सप्ताह आज से
 जयपुर @ पत्रिका. इंडियन आर्थोपेडिक एसोसिएशन के राजस्थान चैटर की ओर से बोन एंड ज्वाइंट-डे के उपलक्ष में 1 से 8 अगस्त तक जन जागरूकता सप्ताह का आयोजन होगा। इस सप्ताह की थीम वृद्धावस्था में अस्थि क्षण होने के पश्चात विकृतियों को रोकना रखी गई है। इंडियन आर्थोपेडिक एसोसिएशन के अध्यक्ष डॉ आरसी मीणा ने बताया कि इस जन जागरूकता अभियान के पहले दिन शनिवार को पोस्टर विमोचन होगा और एसएमएस अस्पताल के हड्डी रोग विभाग में आने वाले बुजुर्ग मरीजों को अस्थि व जोड़ रोगों के बारे में जानकारी दी जाएगी।
 Rajasthan Patrika
 01.08.2020

Bone & Joint Day Activity
Goyal Hospital & Bone and Joint Health Foundation
Present

जीवन की तीसरी पारी
 सीधे रास्ते सीधी हड्डियां

VIRTUAL TALK SHOW
 Sunday, 9th August 5pm
LIVE
<https://www.facebook.com/GoyalHospitalJaipur/>

Dr. Rajesh Goyal President, ROCA
Dr. Rahul Katta Secretary, ROCA
Dr. Vinay Goyal Program Director

Kota Region

Poster on : 'Prevention of deformity in degenerative bone disease' was released by commissioner Mr K C Meena. Free mask distribution was also done.

Plantation was done at New Medical College Hospital - NMCH, Kota campus On 2 August, 2020



Udaipur Region

JOA-ROSA poster and car stickers were released at office of Principal AND Controller RNT Medical College Udaipur by Dr Lakhan Poswal, Principal, Dr A.K.Verma, Dr Lalit Reger Additional Principals, Dr Vinay Joshi Immediate Past President Rosa, Dr Anurag Talesra Honorary Secretary Udaipur Orthopaedic Society [UOS] and Dr M P Jain Treasurer UOS.

Awareness about Knee braces & its uses explained to PG students and to patients was done in a symposium by Dr Vinay Joshi, Dr A K Mehra And Dr. Anurag Talesra.

10000 caps and masks, bone and joint pamphlet s distribution done by various UOS doctors in clinics and hospitals and at Fatehsagar lake to morning walkers

All uos doctors participated actively Dr Ratan Sharma, Dr C K Ameta, Dr Vinod Porwal, Dr Anil Gupta, Dr M S Parihar , Dr Mukesh Jain & Dr Chirayu Pamecha

Sanitization machine donated by Jain Social Group Mewar in Ortho OT and OPD, program conducted under chainmanship of Dr R L Suman Superintendent MBGH Udaipur,Dr Vinay Joshi, Dr Anamendra Sharma and Dr Anurag Talesra

The activities were highlighted in various national news papers the next day appreciating the move taken by BOSA and IOA.



इंगूरपुर। शुक्रवार, 07 अगस्त 2020
www.aatmakijwala.com

4

बॉन ज्वाइंट वीक पर कार स्टीकर एवं पोस्टर जारी



उदयपुर आर्थोपेडिक सोसायटी- पोस्टर लॉन्च करते मेडिकल कॉलेज के प्राचार्य एवं अन्य चिकित्सक।

आरामा की ज्वाला
www.aatmakijwala.com
उदयपुर। प्रति वर्ष उदयपुर आर्थोपेडिक सोसायटी द्वारा आयोजित किया जाने वाले बॉन एंड ज्वाइंट वीक के तहत इस बार कोरोना महामारी के कारण आरएनटी मेडिकल कॉलेज के प्राचार्य डॉ. लाखन पोसवाल ने जनता को जागरूक करने हेतु कार स्टीकर एवं पोस्टर जारी किया। सोसायटी अध्यक्ष डॉ. बी.एल.कुमार ने इस अवसर पर बताया कि यदि हमारे शरीर की हड्डियां

मजबूत होंगी तो हमारा राष्ट्र मजबूत होगा। सोसायटी सचिव डॉ. अनुराग तलेसरा ने बताया कि प्रतिवर्ष इस अगस्त माह के प्रथम सप्ताह में बॉन एंड ज्वाइंट वीक मनाया जाता है जिसके तहत अनेक गतिविधियां आयोजित की जाती हैं लेकिन इस बार स्टीकर एवं पोस्टर जारी कर आमजन को जागरूक किया जा रहा है कि वे दुर्घटनाओं में कमी लायें ताकि अपने शरीर की हड्डियों को बचाया जा सके। इसके अलावा कुछ स्थानों पर हड्डियों

जांच शिविर, वार्ता आयोजित की जायेगी ताकि जनता को जानकारी दी जा सके। डॉ. लाखन पोसवाल ने कहा कि उदयपुर आर्थोपेडिक सोसायटी पिछले 5 वर्षों से जनता के लिये मानव हितकारी अनेक कार्यक्रम आयोजित कर समाज सेवा की जा रही है जो सराहनीय है। इस अवसर पर अतिरिक्त प्राचार्य डॉ. ए.के.वर्मा, अतिरिक्त प्राचार्य डॉ. ललित रेगर, रोसा के निवर्तमान अध्यक्ष डॉ. विनय जोशी, डॉ. एम.पी.जैन मौजूद थे।

Jodhpur Region

Free OPD camp on Bone & Joint Day were organised by Dr Rahul Garg at Medipulse Hospital, Dr Arun Vaishy at MDM Hospital, Dr Kishore Raichandani & Dr Hemant Jain at Mahatma Gandhi Hospital, Dr Rajeev Siwach at Siwach Orthopaedic Hospital, Dr Manohar Parihar at Parihar Fracture & Ortho Centre, Dr Deepak Shekhawat, Dr Hari Ram, Dr Kamlesh Malviya, Dr Rajneesh Sharma at Bone & Joint Hospital, Dr Hitesh Chouhan at Radiant Paediatric Orthopaedic Hospital, Jodhpur.

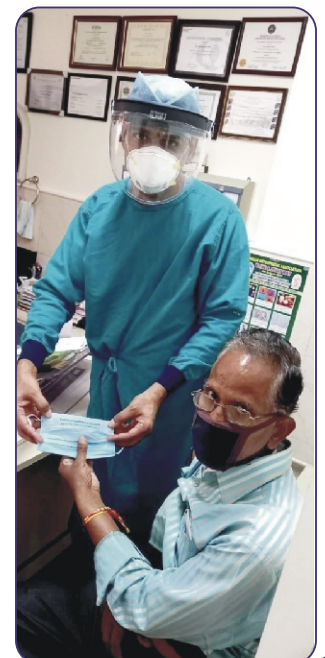
Six free surgeries done at MDM Hospital during the week.



Ajmer & Bharatpur Region

By Ajmer Orthopedic Society distribution of face mask, patient awareness programs and motivational videos on social media were done.

Bharatpur Orthopaedic Surgeons Association also organised a free OPD camp.



IOACON 2020 NE Mumbai Momentum Webinar

In the series of webinars by MOA & BOS, they invited ROSA for an interactive webinar on Complex/Complicated Intra-Articular Fractures: Case Based Discussions. It was held on Sunday, 20th September 2020 and Moderated by Dr G S Kulkarni (Miraj) and Dr Rahul Katta (Jaipur). Webinar was chaired by Dr Ajit Shinde, President MOA, Dr S S Mohanty, President BOS, Dr Parag Sancheti, Conference Director, IOACON2020NE, Dr Ram Chaddha, Organising Secretary, IOACON2020NE and Dr. Rajesh Goel - President ROSA. Among the faculties ROSA Faculty members were Dr Rajeev Bhargava, Dr Jayant Sen, Dr Kuldeep Nathawat, Dr Sumit Banerjee and Maharashtra faculty members were Dr G S Kulkarni (Miraj), Dr Nicholas Antao (Mumbai), Dr Pankaj Ahire (Mumbai) and Dr Ashish Phadnis. Total 10 cases of difficult intra-articular fractures including pumpkin's fracture, distal femur, proximal tibia, distal humerus and proximal phalanx were presented and discussed. Webinar was attended by around 650 orthopaedic surgeons.

IOACON 2020 NE Mumbai Momentum Webinar

Case Based Discussion: Complicated/ Neglected Intra-Articular Fractures

Programme:
 Welcome Address: Dr Ajit Shinde
 Dr S S Mohanty
 Dr Parag Sancheti
 Dr Ram Chaddha

Case based discussions:
 1. Dr Rajeev Bhargava
 2. Dr Jayant Sen
 3. Dr Kuldeep Nathawat
 4. Dr Sumit Banerjee
 5. Dr G S Kulkarni (Miraj)
 6. Dr Nicholas Antao (Mumbai)
 7. Dr Pankaj Ahire (Mumbai)
 8. Dr Ashish Phadnis (Mumbai)

Moderators: Dr G S Kulkarni, Dr Rahul Katta

Date: Sunday, 20th September 2020
Time: 10:30 AM

MOMENTUM: A MOA-BOS INITIATIVE

Link: <https://tiny.cc/moaalive>

Team Momentum:
 Dr Sandeep Biraris, EC Member, MOA
 Dr Pradip Nemade, Web Editor, MOA
 Dr Dhruj Sonawane, Web Editor, MOA
 Dr Kishij Chaudhary, Webmaster, MOA
 Dr Mahesh Bhande, Webmaster, BOS
 MOA & BOS EC

All About Meniscus: IAS-ROSA Webinar

In the series of webinars by MOA & BOS, they invited ROSA for an interactive webinar on

A webinar on "All about meniscus" was conducted on 06th September 2020 between 5 pm and 7 pm.

This was a combined meeting under the flagship of Rajasthan Orthopaedic Surgeons Association and Indian Arthroscopy Society. Dr. Rajesh Goel (President, ROSA), Dr Rahul Katta (Secretary, ROSA), Dr IPS Oberoi (President, IAS) and Dr Swarnendu Samantha (Secretary, IAS) presided over the meeting.

The Webinar was moderated by Dr Saurabh Mathur and Dr Sachin Jain and co-ordinated by Dr Pradip Nemade and Dr Sandeep Biraris.

Dr S R Sundararajan, Dr Rajeev Raman, Dr Vikram Mhaskar were the eminent national faculty, while local panelists from the state included Dr Rajiv Gupta, Dr Prashant Modi and Dr Sumit Banerjee.

There was a comprehensive discussion on all the aspects of the meniscus which included meniscus repair techniques, bucket handle repair, ramp lesion repair and root repair.

There were 2 panel discussions on decision making in meniscus tear and case based discussion by the national faculty.

The meeting had around 483 live views on you tube and each talk was very well appreciated by all the delegates. The webinar is available online and can be rewatched on you tube IAS Live Webinar: 89- IAS- ROSA: All About Meniscus.

Indian Arthroscopy Society (IAS)
 In Association With
Rajasthan Orthopaedic Surgeons Association (ROSA)

Topic: All About Meniscus

Program
 Meniscus Repair Techniques
Dr Rajiv Gupta

Meniscus Bucket Handle Tear Repair, Alternative Techniques
Dr Vikram Mhaskar

Meniscus Ramp Lesion Treatment
Dr Sumit Banerjee

Meniscus root repair
Dr Prashant Modi

Decision Making in Meniscus tear Talk cum discussion
Dr Rajeev Raman

Case based Discussion on Meniscus tears
Dr S R Sundararajan

Moderators:
 Dr Saurabh Mathur
 Dr Sachin Jain

Webinar Co-Ordinators:
 Dr Pradip Nemade
 Dr Sandeep Biraris

Date: 06th September 2020
Time: 05:00 PM IST Onwards

Live on:
<https://tiny.cc/liveias>

Osteoporosis Symposium 2020

Fourth Annual Diabetes Thyroid Endocrine Conference (DTECON) 2020 was held on the virtual platform from 18th to 20th September 2020. This covered various important topics related to management of Thyroid, Diabetes, Andrology and other endocrinology issues including metabolic disorders like obesity. The highlight was a dedicated full symposium on management of osteoporosis held with association of ROSA that had participation from orthopaedic surgeons talking about practical surgical issues while dealing with the associated fractures and endocrinologists sharing pearls of wisdom in perioperative and preventive management.

The second session of the symposium on 19th September 2020 had a lot of background efforts by Dr Rahul Katta (Hon Secretary ROSA) and Dr Abhimanyu Kakralia and was the most well attended session of the conference with more than 1500 participants.

The speakers were Dr Mangesh Pangat (Aurangabad), Dr Rahul Katta (Jaipur), Dr S B Solanki (Jaipur), Dr Amit Jain (Jaipur), Dr Jitesh Jain (Jaipur) and Dr Abhimanyu Kakralia (Jaipur). The topics covered the full gamut of Osteoporosis from diagnosis and role of DEXA, implications in Orthopedic practice, Hip - Vertebral and Periprosthetic fractures and myths and fallacies in Osteoporosis management. The session was chaired by ROSA President Dr Rajesh Goyal and moderated by Dr Arun Vaishy (President Elect ROSA) and Dr Jayant Sen.

D-TECON 2020
DIABETES THYROID ENDOCRINE CONFERENCE

Osteoporosis Symposium 2020
In association with Rajasthan Orthopaedic Association (ROSA)

JOSLIN HALL | DAY 2
19 SEPTEMBER 2020

16:35-16:50	Dr Mangesh Panat	DXA and it's interpretation in Osteoporosis	
16:50-17:05	Dr Rahul Katta	Osteoporosis and its Implications in Orthopaedic Practice	Chairperson: Dr Rajesh Goyal
17:05-17:20	Dr S.B. Solanki	Challenges in osteoporotic hip fractures	
17:20-17:35	Dr Amit Jain	Vertebral Fractures	Moderator: Dr Jayant Sen
17:35-17:55	Dr Jitesh Jain	Periprosthetic Fractures in Osteoporotic patients	
17:55-18:10	Dr Abhimanyu	Distorted concepts & Fallacies in the management of osteoporosis	Dr Arun Vaishya

ROSA P G Quiz 2020 for Dr Girija Nath - Leela Sen Gold Meda

RAJASTHAN ORTHOPAEDIC SURGEON'S ASSOCIATION

MID TERM ROSACON 2020 Virtual Conference
Sunday 12th July, 2020 Time: 09:00 AM - Onwards

Hurry! Up
Registration Deadline:
10th July 2020 5.00 PM
Last 24 Hours Remaining

"Discover the new trends of Knowledge, Wisdom & Excellence in orthopaedics"

ROSA PG QUIZ - ONLINE QUIZ
(DR GIRIJA NATH - LEELA SEN GOLD MEDAL)
Sunday 12th July 2020
1:00 - 2:00 PM

Eligibility - All PG students of any institution in Rajasthan pursuing MS/DNB Orthopaedics. Letter from Head of Department mandatory.

Moderator: Dr. Vaibhav Bagaria, President SICOT India
Convener: Dr. Jayant Sen, Chairman Scientific Committee

PG quiz 2020 was organized on July 12th 2020 virtually during MIDTERM ROSACON. Dr Vaibhav Bagaria, President SICOT INDIA from Mumbai was the moderator and Dr Jayant Sen was convener for this quiz. There were 37 participants across Rajasthan.

Dr Girija Nath - Leela Sen Gold Medal for standing 1st gone to Dr Abhishek Chandra from SMS Medical College Jaipur.

Dr Sandeep Kumar from Govt. Medical College Kota was the runner up and will join Dr Abhishek Chandra in the ROSA team for IOACON PG Quiz.

ROSA Executive Committee Meeting, (minutes)

Online Video Meeting

Saturday 27th July 2020, 09:00 p.m.

The meeting was attended by -

1. Dr Rajesh Goyal (President)
2. Dr Arun Vaishy (President Elect)
3. Dr Rahul Katta (Secretary)
4. Dr Saurabh Mathur (Treasurer)
5. Dr Vinay Joshi (Past President)
6. Dr Jayant Sen (Past Secretary)
7. Dr Mohan Mantri
8. Dr C. K. Ameta
9. Dr Rahul Garg
10. Dr Anurag Talesra
11. Dr S. B. Solanki
12. Dr Jagveer Singh
13. Dr K C Gagal
14. Dr Hitesh Mangal
15. Dr Kuldeep Nathawat
16. Dr Vijay Beniwal
17. Dr Ashok Khandaka

1. The meeting was chaired by Dr Rajesh Goyal (President). He asked the Secretary Dr Rahul Katta to start with the agenda.

2. Obituary: Dr Rahul Katta Secretary informed that he had no information about any unfortunate happening and that all members were in good health.

3. ROSACON 2021: Progress Report by Organizing Secretary Dr. Ashok Khandaka. Dr Khandaka informed the executive committee members that venue and faculty was finalized, tentative scientific program is ready but due to current corona pandemic it would not be possible to organize physical conference on scheduled dates. After discussions it was decided that on current dates ROSACON 2021 cannot be organized, so it should be postponed and the revised schedule to be decided in the next EC meeting in Oct-Nov.2020 based on the situation of pandemic and government policies.

4. ROSA Elections: This year elections are due for the post of President Elect [President 2022]. EC members discussed various issues of conducting elections during corona pandemic, change of guard ceremony and AGM. Dr. Mohan Mantri pointed out that constitutionally it is mandatory to have elections every year and parent body

IOA is also conducting elections. Dr Ameta and Dr Vinay Joshi also expressed same views. Dr Solanki said as elections would be online so there are no issues in conducting. Dr Jayant Sen said that it is mandatory to have elections within 14 months and change of guard must be done in AGM irrespective of annual conference. Dr Anurag Talesera and Dr Kuldeep Nathawat said that Annual General Meeting (AGM) is also necessary. In view of current corona pandemic if annual conference gets postponed or does not materialise in physical form, AGM may be held virtually giving enough notice to the executive committee and members. After the discussion a resolution was passed unanimously by all members of executive committee that elections would be held as per declared schedule and the change of guard would be in next AGM, dates for which would be decided in next EC meeting preferably. Executive committee directed Dr Arun Vaishy, President Elect and Election officer to start election process as per the declared schedule.

5. Bone And Joint Week Activities: President, Dr Rajesh Goel and Secretary Dr Rahul Katta briefed about all the related activities in detail as proposed by CSRC committee IOA and all agreed to take part actively.

6. MIDTERM ROSACON 2020: Feedback Secretary Dr Rahul Katta informed that Mid Term ROSACON 2020 meeting was organised as a virtual conference on 12th July 2020 with online PG quiz. With more than 2800 views it was highly appreciated by all faculty members and attendees. Online P.G. quiz for Dr Girija Nath- Leela Sen Gold Medal was also conducted. All executive committee members said that they have received very positive feedback from across the country and it was a landmark pioneering event for ROSA.

7. Membership Drive: Secretary Dr Rahul Katta informed that compiled list of ROSA and IOA members has been prepared with Zonewise division. All executive members were encouraged to help in the membership drive for ROSA & IOA.

With no other matter to discuss, President Dr Rajesh Goel thanked President Elect and all other members for active participation, positive suggestions and valuable contribution towards the progress of ROSA and a fruitful meeting.



Dr Rahul Katta
Secretary ROSA

My Journey of Covid - 19

It all started on June 23rd 2020 when suddenly I experienced sore throat that worsened the next day along with fever and headache. I was casual about it but called up a lab technician to get myself tested for COVID19. Though I was rather relaxed after giving the sample, my family was concerned and little worried.

Then came the result on 25th of June, around 8 am while I was enjoying with my friends, and that was positive. Promptly, I left for home and prepared for self quarantine, informed my family and also consulted Dr Sandeep Arora and Dr Prakash Keswani. My treatment started under their supervision.

I decided not to lose heart, stay confident and positive. I also had to reassure and encourage my family. Soon my family members and all staff members also got themselves tested for COVID19 and by God's grace, they were all negative. This gave me the much needed relief and strength to fight the disease.

As the news spread, I started getting calls from my relatives, friends and other well wishers. As they were all concerned about my health each had his share of advice and suggested remedy whether its ayurvedic kadha, warm water gargles, steam inhalation or turmeric milk. I was monitoring my Oxygen saturation - SPO2 and temperature at regular intervals. As days passed, my symptoms were disappearing and I was feeling better day by day.

I kept myself busy and was watching BBC Earth, Animal Planet and Movies. Especially the movie 'Life of Pie' gave me a lot of hope, perspective and positive mindset.

On 2nd of July, I got myself tested again but the report was still positive. It was a momentary setback for me. I was unable to sleep that night and consulted the doctors. I understood from them that the test results might have come positive because of the dead virus in my body though all symptoms had subsided by then.

To boost my moral, I indulged myself in gardening, listening to music from carvan. I deliberately avoided

watching news on Covid-19. Meanwhile I took this opportunity of seclusion to attend a webinar. I had set my routine and ensured my food is served outside of my room door only.

I was again tested on July 9th and the report still came positive. I laughed at the report and realized that my quarantine period has not ended yet. My plight made me remember the song from the legends Mohammed Rafi and Asha Bhosle "Abhi naa jao chhod ke, ki dil abhi bhara nahi". My family was really worried but the doctors were relaxed. By now I had got used to the quarantine way of life. I enjoyed watching Motor bike / motor cycle solo and group tours to Leh, Ladakh and other hilly terrains on youtube.

Finally on 13th July I tested negative and there was a sigh of relief for everyone. I needed to be sure and hence confirmed this with a retest which was also negative. On 17th of July, my life in solitude ended.

I resumed my daily life, started going to hospital, started my morning walk, cycling and also started some level of workout. Now I had art an example of a true "Corona Warrior". I started telling people not to be afraid of Corona virus and how to cope up with this situation if confronted.

After a month I heard about the possibility of plasma donation by successfully recovered patients to help corona affected ones. This inspired me towards a noble cause and professional duty as a caring doctor. I donated my

plasma on 19th September with an immense self satisfaction that some part of me shall now help to save someone else's life.

Having gone through this entire ordeal, I reiterate the need for standard operating protocols (SOP) for prevention, be it a professional like us or the society.

Before I conclude, I most humbly request all those who have recovered from corona to please come forward and donate plasma to help others fight this disease and save lives.



Dr Naresh Goyal

DNG Orthopaedic Hospital, Jaipur

Different Strokes....

Good art is all about conveying your message beautifully using any form of expression and is never restricted by the medium utilized. Instead it's the ingenuity and creativity of the artist which brings out the seemingly implausible aesthetic in objects which on first and sometimes even a second glance seem utterly distant from beauty.

A fine example is the art of painting, using nothing but fire and smoke on paper as demonstrated in the images above. Dr Anil Banga has been practicing this technique for nearly past two decades and has mastered the Art.

Where everyone sees black smoke on paper, he visualizes intricate lines and patterns, which he then painstakingly polishes into immaculate visual poetry.

This technique requires not just a vivid imagination of an artist, it also requires the precision of a surgeon because every single stroke once made can't be undone unlike traditional pencil or paint strokes.

It is therefore quite pertinent that Dr Anil Banga an amazing Orthopedician amalgamates his creativity and experience as a surgeon in creating these magnificent pieces of art.

Once the picture is complete, he then uses a special resin to encapsulate the creation so that it can be treasured permanently.



Out of his huge collection of works which incidentally are sold across the globe, two are reproduced here.

The first one poignantly depicts the joy of a child who is getting to spend time at home with both his parents during the COVID-19 pandemic. It is an interesting take on not just the pandemic but the complexities of modern life and a child's perception of it.

The second picture is an offering to the almighty and a prayer for health and prosperity for all. It represents all our hopes and wishes as we seek blessings this festive season for an early return to health and normalcy in the world.

Dr Anil Banga

Tyger Tyger Burning Bright

A Lucky Wildlife Safari

Date : 5th May, 2019

Place : Bandhavgarh Tiger Reserve (Tala zone)

Time : 6.15 am

Event: Witnessing Tigress named SOLO hunting a spotted deer (live)



We three amateur wildlife photographer friends, Dr Rangnath (an Ortho surgeon, SMS Alumini), Manjunath and I, were on the last day of our 5 day (9

safari) tour. After 4 days and 8 grueling summer safaris, we were dead tired and exhausted, having spotted 14 different tigers in 4 days and each having satiated oneself with a few Tera-bites of photographs.

So, we all were a bit reluctant about going for this final safari, but eventually, during the Saturday evening dinner, we half-heartedly agreed to do it. Dr Rangnath was unwilling to join the last safari till we said goodnight.

Believe me, it was Rangnath who woke me up at 4 am and coaxed me into getting ready fast (my friends know that I am notorious for not getting up early). All three of us left our hotel for our Sunday morning safari at sharp 4:30 am. The gates opened at 5 am and we were the first ones inside the Tala zone of Bandhavgarh, searching for the tiger even before sunrise. They say that the one who enters first has the best chance of spotting the tiger. After about 15 minutes of travelling in the forest, we saw tiger pugmarks and the driver halted to hear the direction of “tiger call”. Within a few minutes, we all heard the langur's unmistakable and sure alert call. We moved towards the direction of the call and saw a few gypsies halted at a place with people standing in their vehicles and looking in a direction, some pointing towards the bushes and asking us to be quiet. We could not see the tiger, and as we were groping for the elusive cat, our driver hurriedly instructed in a loud whisper “saab jaldi se baitho aur kas ke pakad lo hum tez bhagayenge gaadi”.

Again, believe me, the manner, and the speed with which in he drove the gypsy I still don't believe how we did not meet with an accident. And within 5 minutes of crazy driving, he braked in front of the tiger. We saw the spotted deer still struggling, and ultimately giving in to the tigress SOLO who had grabbed him by its throat. Hats off to the driver, and thanks to his skill that we witnessed this awesome spectacle. This is how the jungle is moksha to some and breakfast for another. Witnessing a live tiger kill is perhaps once in a lifetime event for most. The last safari that we were reluctant about doing proved to be our best and is still the best till date.

We saw Solo carry the kill in her jaws majestically across the pathway and pull it up the small hill near her den where her cubs were hiding. Her body brilliance taught us so many lessons and I was overwhelmed by a million thoughts at the same time. There amid scanty bushes she sat down to comfort her exhausted body. It was then time for her to do the honors, and we could see it in her eyes the pride of a successful bounty. The moment her teeth gnawed the velvety flesh it seemed as if nature has paid her in full for her toil. The shutterbugs could not resist the movement of their fingers as they wanted to amass every second of the precious moments.



Once she was through with her share of the kill, we saw her cubs joining in to enjoy the feast. We watched the family together for a while, enjoying their time together. It was thrilling to watch and discuss the resembling attributes of human and tiger families. And then finally it was time for us to leave them alone, reluctantly, because it was time for safari gates to close. We left the tigers satiated and we were no less satiated ourselves.

I can never forget that prodigious moment for the rest of my life as for now and I can proudly say so for my friends as well. It was breadth-taking yet satisfying safari for all of us. And we returned with a good store of unbelievable and amazing memories of the last day at Bandhavgarh. To say that we still get goosebumps remembering that moment is an understatement.

Wildlife lovers travel thousands of kilometers from across the world to reach these forests to get a glimpse of the Bengal tiger. Just a sight of the beautiful cat makes one forget all the pain of long travels and consider all the effort worth it.

Alas

SOLO was considered the most beautiful of the Bandhavgarh tigers.

I say “SOLO was” because **SOLO and her two cubs are no more.**

It is sad to know that recently (2nd week of October, 2020) Solo and her two cubs were found dead in Damokhar range, the buffer area of Bandhavgarh. A retribution killing by the villagers is disheartening and sad. The rising conflict between wild animals and humans has ultimately costed three beautiful tiger lives perhaps the most beautiful and graceful of the cats.



Tiger Tiger BURNT BRIGHT....

Dr Aashish Sharma



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Patent Journal No. 33/2019 Patent Publication Date 16/08/2019
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