



Billroth  
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# INSTITUTE OF ORTHOPAEDICS

MARCH 2025 - Billroth Hospitals





**Dr. V. Jeganathan**  
Founder, Billroth Hospitals



**Billroth**  
Hospitals

*"It has been said that a gentle word, a warm hand, a willing ear and small acts of kindness, often taken for granted, can change a life. We believe that to be true. Because we have seen first-hand the power of caring with compassion."*

*~ Dr. V. Jeganathan - Founder*

## MAN WITH VISION...

### The Seed was Sown

An extraordinary physician of our times, **Dr. V. Jeganathan** watched thoughtfully as the first bricks for his dream hospital were laid. His vision for creating a world-class healing environment that would attract the best medical minds was taking shape. He dreamt of creating an institution that would serve as a beacon of hope to patients from across the world, offering them the highest standards of excellence in medical care, delivered with compassion. And so began a journey that started with a 70-bed hospital for Gastroenterology. Now Billroth Hospitals, offers an entire spectrum of Medical Care.



**SINCE 1990, THERE WERE NO  
COMPROMISES AND NO LOOKING  
BACK AT BILLROTH HOSPITALS.**

# Where Care Comes First



# ARTHROSCOPIC ASSISTED ANKLE/SUBTALAR ARTHRODESIS (AAAA) USING A HIND-FOOT NAIL

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The arthroscopic assisted ankle arthrodesis (AAAA) is a minimally invasive procedure for end-stage ankle arthritis with numerous benefits like faster time of union, insignificant blood loss, less morbidity, less infection rate, and less soft tissue complications.

End-stage ankle arthritis causes significant pain, disability, and reduction in the quality of life. The common causes of ankle arthritis are post-traumatic (70%), secondary to rheumatoid arthritis (12%), and idiopathic (7%). Surgical arthrodesis of the tibio-talar joint is used to help alleviate the symptoms and signs of end-stage ankle arthritis.

The first documented description of ankle arthrodesis is by Albert of Vienna in 1879, who reported curettage of the articular cartilage to enable fusion of the ankle joint. Since that time, this process has been refined significantly culminating in the introduction of arthroscopic assisted ankle arthrodesis (AAAA) by Schneider in 1983. AAAA is now considered as the current gold standard to help achieve effective and predictable pain relief and improved function for patients who suffer with end-stage ankle arthritis.

## INDICATIONS FOR ANKLE ARTHRODESIS:

- Arthritic stiff and painful ankle joint that has failed conservative management
- Patients who may have a poor soft-tissue envelope, are at risk of wound complications due to comorbidities such as diabetes, peripheral vascular diseases, and/or have mild-to-moderate ankle joint deformity.

## CONTRAINDICATIONS

- Significant malrotation (Deformity)
- Significant bone loss
- Failed previous fusion
- Active infection

These are 2 illustrative cases where AAAA was performed for end-stage arthritis of ankle and sub-talar joints.

## CASE REPORT 1:

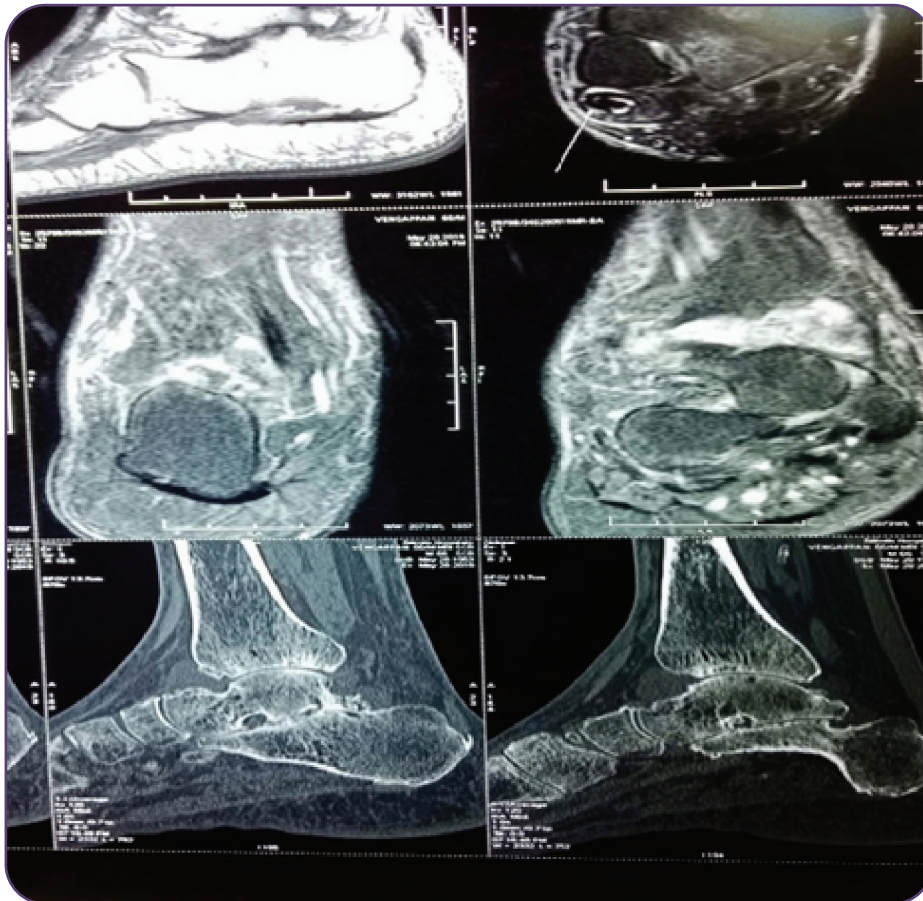
65 years old ex-farmer presented with severe left ankle pain on standing and walking for 6 months. 18 years prior he had injury to that ankle joint which he got treated elsewhere.

On examination his ankle joint was very stiff, swollen and painful. There was tenderness to palpation and gross limitation of movements both dorsiflexion and plantarflexion.

The x rays and MRI imaging of ankle revealed severe arthritis with joint space narrowing of the joint. The blood tests were done to rule out sepsis which apparently were negative. Initially he had treatment in the form of pain medications and physiotherapy which did not help. He had one shot of intra-articular injection which helped his pain for only 2 months. His symptoms were so disabling that he opted for surgery.

Fusion (arthrodesis) or replacement (arthroplasty) are the two options available for end-stage arthritis of ankle. He was not considered for ankle replacement because of his highly demanding life style and high cost. So ankle fusion surgery was done by Arthroscopic assisted technique.





**FIG 1: CT IMAGES SHOWING SEVERE DESTRUCTIVE ARTHRITIS OF ANKLE AND SUB-TALAR JOINTS.**

Traditionally ankle and sub-talar fusion was done by open method involving bigger incisions. Arthroscopic assisted procedures has the advantages like minimally invasive, less pain and quicker recovery. However Ankle arthroscopy is not routinely done by many surgeons because of the technical difficulty due to joint space constraints compared to knee and shoulder arthroscopy.

Ankle and subtalar fusion was done using a Hind foot nail fixation. This was done minimally invasive method using C-arm and nail was used to fix both ankle and sub-talar joints together. Post-operatively toe touch weight bearing for 3 months followed by progressive weight bearing. At the end of 3 months there was solid fusion of the ankle and sub-talar joint and his pain disappeared and was able to walk fully weight bearing on the affected side.

## CASE REPORT - 2

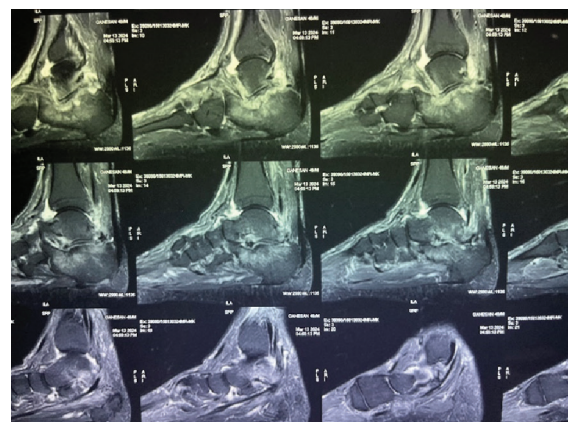
50/M, presented with post-traumatic subtalar arthritis and severe pain on weight bearing for more than 2 years. He had injury 2 years ago and was treated elsewhere.

The present x ray images showed severe arthritic changes in the sub-talar joint with reasonable preservation of ankle joint.

The patient tried all conservative methods like medications, weight relieving ankle/foot orthosis. Eventually he was considered for surgical option i.e arthrodesis. Arthroscopic assisted fusion was done owing to the advantages already described. The sub-talar joint was denuded by arthroscopic burr and under c-arm guidance 6.5mm cannulated cancellous screws were driven across the sub-talar joint. The limb was immobilised in plaster cast for 3 months. The weight bearing was allowed after complete radiological fusion.



**FIG 2: X RAY IMAGES SHOWING ARTHRITIC DESTRUCTION OF SUB-TALAR JOINT WITH PRESERVATION OF ANKLE JOINT SPACE**

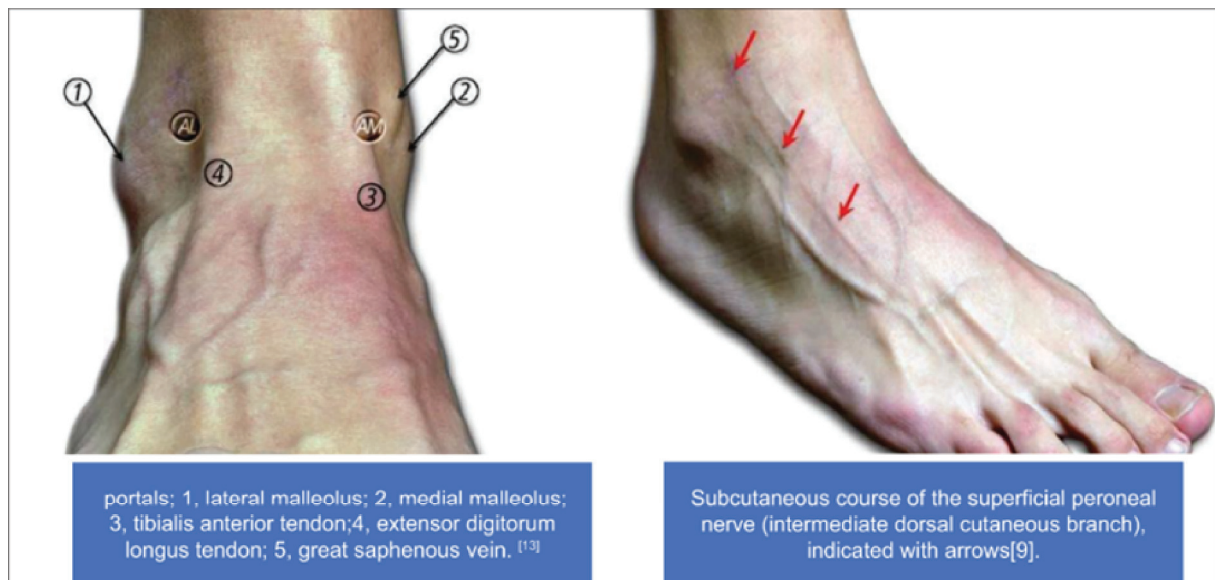


**FIG 3: MRI IMAGES SHOWING INVOLVEMENT OF SUB-TALAR JOINT WITH PRESERVATION OF ANKLE JOINT**

### OPERATIVE SET UP FOR ANKLE/SUBTALAR FUSION:

- The patient is positioned supine for ankle fusion and prone for sub-talar fusion on the OT table
- 30 degree 4mm scope with 4mm shaver and 4mm burr are used



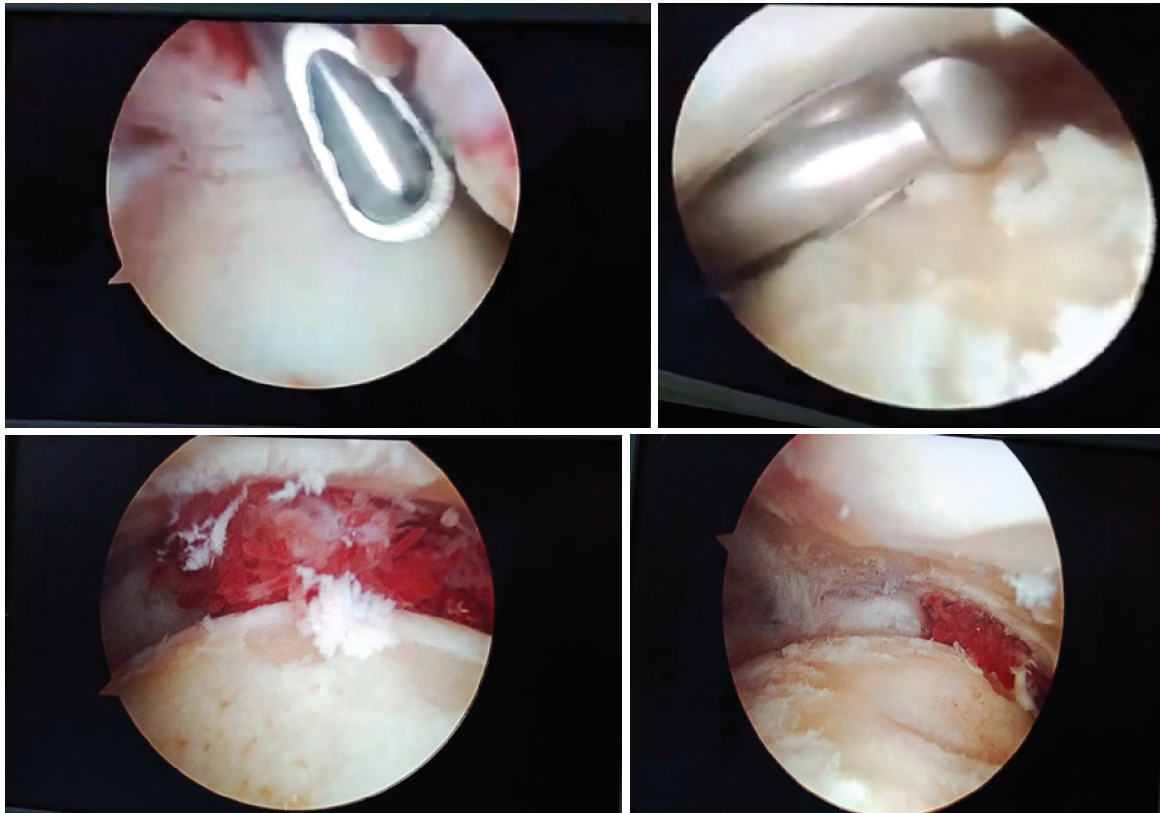


**FIG 4: ARTHROSCOPIC PORTALS FOR ANKLE FUSION**



**FIG 5: SUPINE POSITION OF THE PATIENT FOR ANKLE ARTHROSCOPIC FUSION**

An anteromedial portal is the viewing portal and anterolateral (AL) portals is the working portal.



**FIG 6: ARTHROSCOPIC IMAGES OF THE ANKLE JOINT, DENUDATION OF ARTICULAR CARTILAGE USING SHAVER AND BURR:**

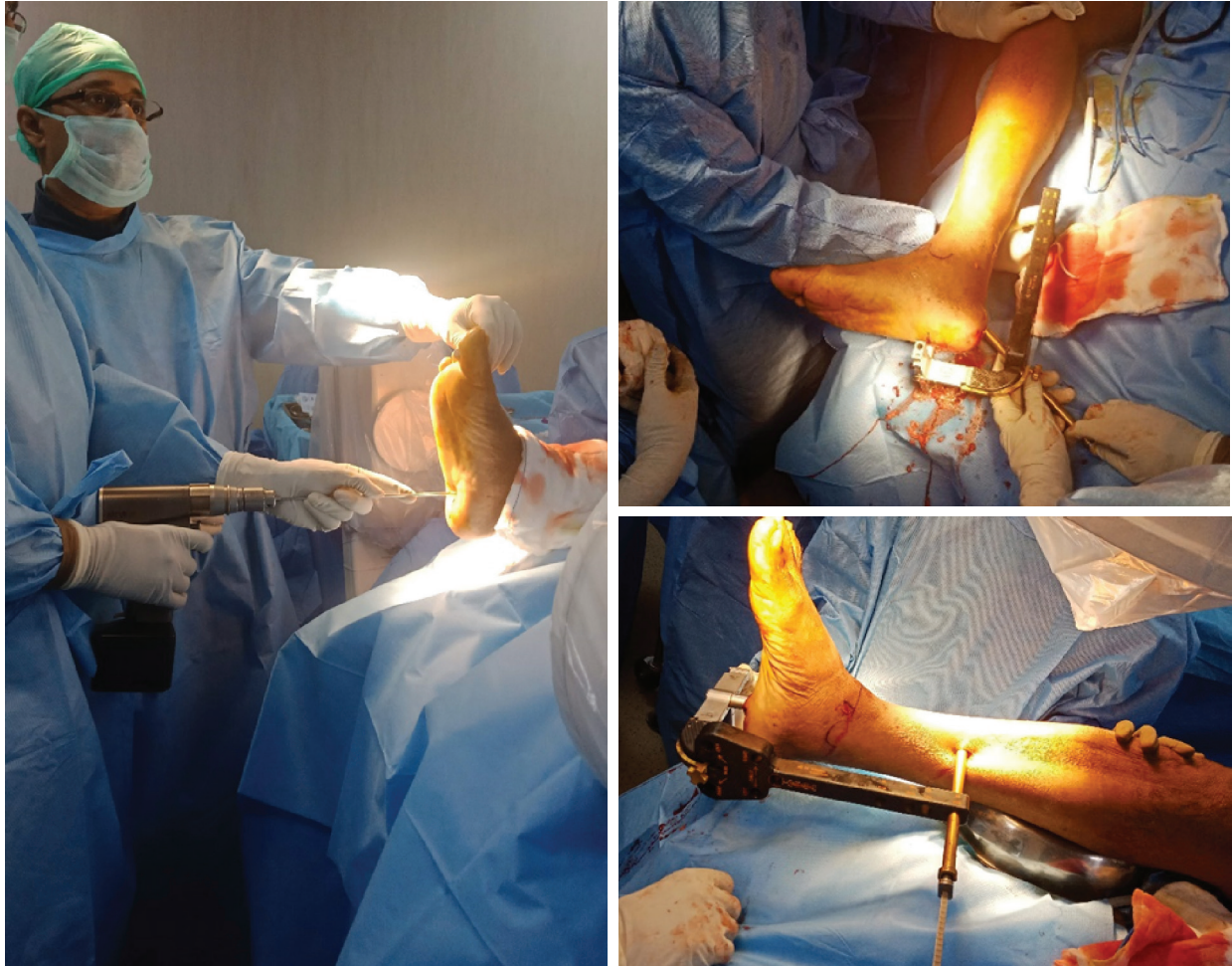
To prepare the articulating surfaces, the required instruments are a 3/4 mm soft-tissue shaver, 4 mm burr, and curved curettes.

The articulating surfaces are then prepared sequentially. It is common to start with the talus as it is less vascular. The 4 mm burr and curettes are used to remove any remaining cartilage and subchondral bone. The goal is to reach bleeding subchondral bone on either side of the joint and maximize the surface area across which fusion can take place.

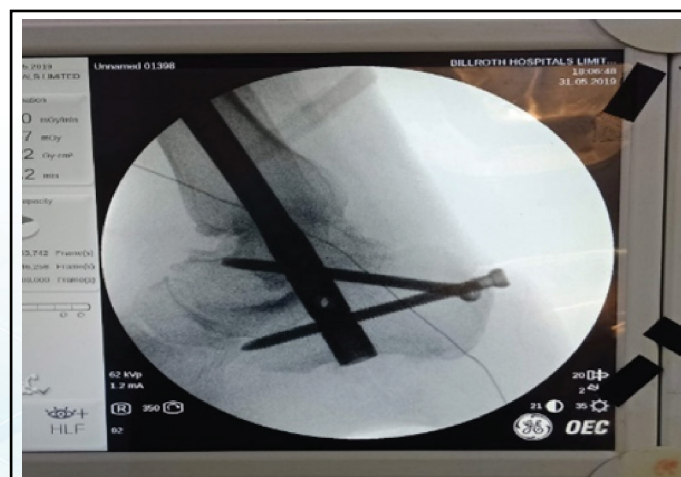
Once the joint surfaces are adequately prepared, the ankle is placed in the optimal functional position. For ankle fusion, position is accepted to be neutral dorsiflexion (plantigrade), 0–5° valgus, 5–10° external rotation, and/or symmetrical to the healthy joint, and the talus positioned directly under the anatomic axis of the tibia on the lateral view. Ankle fusion can be done either by cancellous screws or a Nail. In this case a nail device is considered a better way to hold the fixation because of its bio-mechanical advantages and minimally invasive way of fixating both ankle and sub-talar joint by a single device. Usually a titanium nail inserted from the plantar aspect of calcaneum through the sub-talar and ankle joints into the distal tibia. The nail is locked proximally in the tibia and distally in the calcaneum and talus by locking screws.



**FIG 7: HIND FOOT NAIL IS INSERTED THROUGH CALCANEUM**



**FIG 8: C ARM IMAGES SHOWING HIND FOOT NAIL ACROSS ANKLE AND SU-TALAR JOINTS WITH LOCKING SCREWS PROXIMALLY AND DISTALLY .**



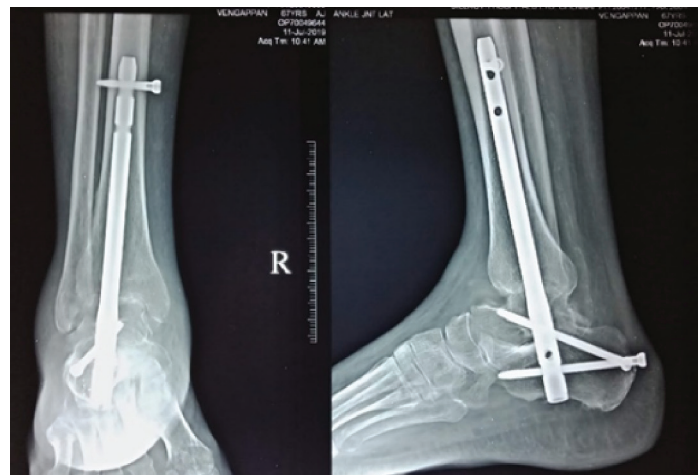
**FIG 9: AFTER COMPLETION OF THE PROCEDURE**



**FIG 10: IMMEDIATE POST-OP X RAY SHOWING  
FIXATION USING HIND FOOT NAIL**



**FIG 11: 3 MONTHS POST-OP X RAY SHOWING  
COMPLETED FUSION OF ANKLE AND SUB-TALAR JOINTS**





## ARTHROSCOPIC SUB-TALAR FUSION:



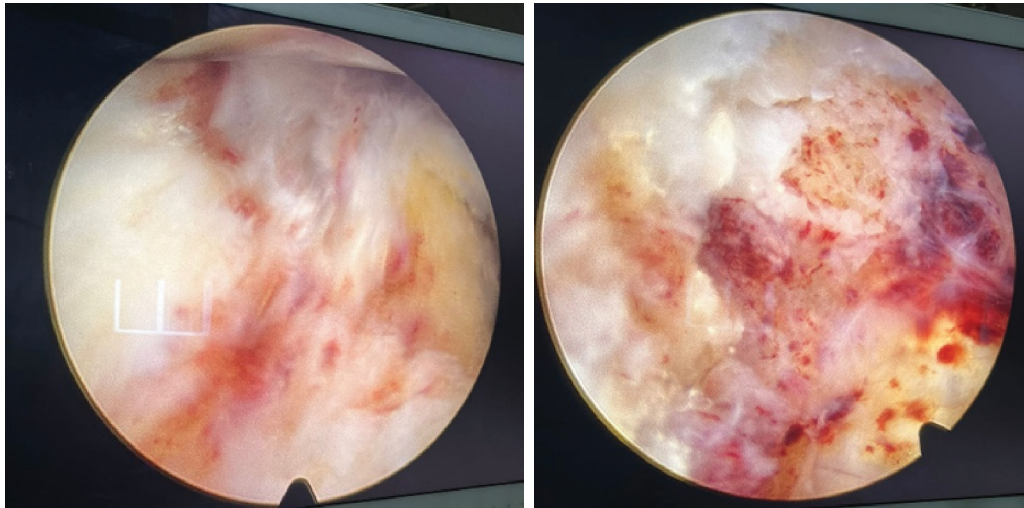
**FIG 12: PATIENT IS POSITIONED PRONE FOR EASY ACCESS TO SUB-TALAR JOINT.**



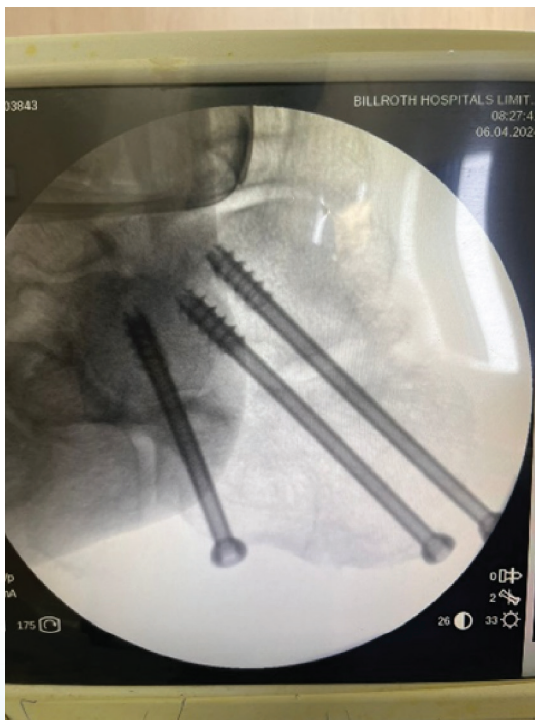
**FIG 13: C- ARM IS USED TO CHECK THE POSITION OF SUB-TALAR JOINT FOR SCOPY AND CANNULA PLACEMENT.**



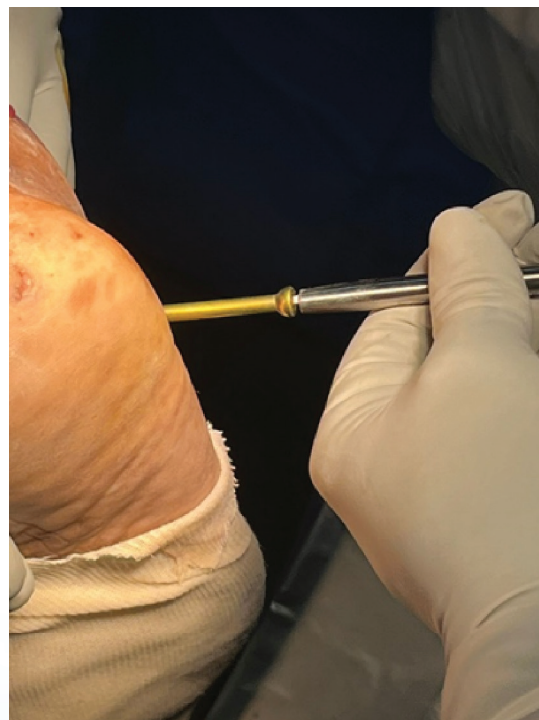
**FIG 14: ARTHROSCOPIC VISUALISATION OF SUB-TALAR JOINT**



**FIG 15 : ARTICULAR CARTILAGE DENUDATION IS DONE USING MOTARISED SHAVER AND BURR**



**FIG 16: C ARM IMAGES SHOWING CANNULATED CANCELLOUS (6.5 mm) SCREWS USED TO TRANSFIX SUB-TALAR JOINT**



**FIG 17 : PERCUTANEOUS CANCELLOUS SCREW FIXATION OF JOINT**





**FIG 18: COMPLETION OF SURGERY**



**FIG 19: POST-OP X RAY OF THE SUB-TALAR JOINT FUSION  
WITH CANNULATED CANCELLOUS SCREWS IN-SITU**

## **AAAA VERSUS OPEN ANKLE/SUBTALAR FUSION**

Research comparing arthroscopic ankle fusion versus open ankle fusion suggests that AAAA may have the following advantages:

- Minimally invasive
- Shorter hospital length of stay
- Better outcomes at 1 and 2 years
- Higher fusion rate
- Shorter tourniquet time
- Shorter hospital length of stay

## OUTCOMES OF AAAA

AAAA offers a safe and effective way of achieving pain relief and improved function for patients who suffer with end stage ankle arthritis. A snap shot of AAAA outcomes is presented below.

- Fusion rate 90.3–97%
- Average time to fusion 9.32–11.8 weeks
- 74% good to excellent results (Mazur grading) and 83% good to excellent (Morgan grading)
- Mean AOFAS improvement before and after surgery increased from 39.71 to 83.3, respectively.

Although open ankle fusion remains a highly effective procedure, AAAA appears to deliver certain advantages over and above open fusion. This was confirmed in the previous studies. Townshend et al. showed that AAAA when compared to open ankle fusion showed shorter hospital length of stay and better outcomes at 1 and 2 years. SF-36 scores for AAAA versus open at 1 and 2 years, respectively, were 46.3 versus 37.9 and 45.0 versus 38.2, and length of hospital stay was 2.5 versus 3.7 days.

Similar findings were echoed by Park et al. who reported that AAAA was superior to open ankle fusion in offering better clinical scores, fewer complications, shorter hospital length of stay, and less blood loss. Union and revision rates were, however, similar in both groups.

## HIGHLIGHTS

AAAA (Arthroscopic assisted ankle/sub-talar arthrodesis) is a technically challenging procedure. It has many advantages like minimally invasiveness and quicker recovery. Using minimally invasive intra-medullary nail fixation has higher rate of success due to its bio-mechanical advantage like axial and rotational rigidity compared to other screw devices.

## REFERENCES:

- 1.Townshend D, DiSilvestro M, Krause F, Penner M, Younger A, Glazerbrook M, et al. Arthroscopic versus open ankle arthrodesis: A multicenter comparative case series. J Bone Joint Surg Am. 2013;95:98-102.
- 2.Park JH, Kim HJ, Suh DH, Lee JW, Kim HJ, Oh MJ,et l. Arthroscopic versus open ankle arthrodesis: A systematic review. Arthroscopy. 2018;34:988-97



# SUCCESSFUL HIP PRESERVATION WITH ORTHOBIOLOGICS IN BILATERAL AVASCULAR NECROSIS OF FEMORAL HEAD

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## CASE REPORT 3:

### INTRODUCTION

Avascular Necrosis [AVN] or Osteonecrosis [ON] is a progressive pathological condition commonly affecting the weight-bearing hip joints, characterized by increased intra-osseous pressure and cell death of subchondral trabecular bone as a result of ischemia. AVN of femoral head if untreated leads to femoral head collapse and subsequently hip osteoarthritis causing severe pain, limping, difficulty in ambulation, restricting almost all day to day activities. Once arthritis settles in, hip salvage is not possible – Total Hip Arthroplasty [THA] or Total Hip Replacement [THR] is the only solution. If patient is diagnosed earlier in the course of the disease – before the onset of femoral head collapse- hip salvage is possible. Core decompression augmented with autologous Bone Marrow Aspirate Concentrate [BMAC] injection is an effective treatment option to biologically restore the hip joint. It not only helps in preventing further disease progression but also promotes in healing and regeneration of the osteonecrotic portion of the femoral head.

### CLINICAL SCENARIO

36 year old home maker came with complaints of pain in both groin and difficulty in cross legged sitting and squatting since three months. Plain radiographs were unremarkable. MRI showed features suggestive of bilateral AVN of femoral head – Ficat and Arlet stage 2 (Pre- collapse) – involving 50 % of the articular surface on the right side and 40 % on the left side [Figure 1]. Patient was counseled and planned for hip preservation surgery – Core Decompression and autologous BMAC injection for both hips in a single stage. Under combined spinal with epidural anesthesia, with the patient in supine position on a fracture table, parts cleaned and draped. Right Hip – Minimally invasive lateral approach was utilized. 3 guide wires were passed targeting the necrosed femoral head under c-arm guidance [Figure 2]. Cannulated drill 4.3mm used over guide wire for core decompression. Thorough wash was given to clear out the bone debris. BMA (46ml) harvested from ipsilateral Iliac crest [Figure 3] and BMAC prepared under sterile precautions using a specialized centrifuge; 6ml of BMAC rich in stem cells was injected into the femoral head via decompression tunnels [Figure 4]. Wound closure done in layers. Similar procedure followed for left hip core decompression and BMAC injection [Figure 5].

Postoperatively, non weight bearing bed side exercises were started. Sutures were removed at the end of two weeks and patient was completely pain-free. Patient was advised bed rest for 6 weeks, after which gradual weight bearing was initiated with the aid of a walker. By 10-12 weeks, patient was able to walk unassisted without the aid of walker and able to do all day to activities. Patient is currently asymptomatic on four year follow up. Yearly MRI scans show no evidence of further progression of disease.

## DISCUSSION

Avascular necrosis of the femoral head (AVN) is a common multifactorial hip pathology associated with pain and functional disability. The main risk factors include alcohol and corticosteroids, which are involved in more than 50% of the cases. Other risk factors include irradiation, trauma, and previous hip surgery, sickle cell disease, pregnancy, coagulation disorders, storage disorders, Cushing's disease, certain drugs, smoking and lipid disorders. Many a time the exact etiology cannot be determined – cause remains idiopathic. It commonly affects the young and middle aged population, with a long remaining life span. Therefore it becomes increasingly important to stop the progression of the disease in the early stages itself, so as to preserve the femoral head and prevent arthroplasty, as long as possible.

Many treatments have been proposed for AVN of the femoral head. Nonsurgical treatments include pharmacologic therapies, such as lipid-lowering agents, anticoagulants, vasoactive substances and bisphosphonates and nonpharmacologic therapies, including extracorporeal shockwave therapy, pulse electromagnetic therapy, and hyperbaric oxygen therapy. Surgical treatments include core decompression, vascularised fibular grafting, muscle pedicle bone grafting, rotational osteotomies and THA. For early (pre-collapse) stage of AVN, core decompression can be done alone or along with adjuvants like orthobiologics (platelet rich plasma or PRP, bone marrow aspirate concentrate or BMAC, recombinant bone morphogenetic proteins 2 and 7 or rh- BMP 2 and 7) and/or autologous bone grafting. Orthobiologics is a subset of regenerative medicine, focused on using naturally occurring biological substances and harnessing their potential to bring about favorable clinical outcomes for musculoskeletal ailments. In our case, we have utilized the biological potential of BMAC to promote repair and regeneration of necrotic bone.

Early diagnosis is crucial for optimal treatment of AVN. The goal of hip salvage or preservation procedures is to prevent progression of the disease and to postpone or alleviate the need for THA. Core decompression is a universally accepted hip preservation treatment option for early AVN of the femoral head. It helps by reducing the intra-osseous pressure and by providing a channel for neovascularization to occur. The use of adjuvant autologous BMAC stimulates a local biological healing response. Injection of BMAC directly at the site of AVN promotes the repair of the necrotic bone by creeping substitution and aids in tissue regeneration since it is rich in osteoprogenitor cells / mesenchymal stem cells and growth factors.

Our patient's four year follow up experience shows that this procedure is effective in providing long lasting pain relief and arresting further radiological progression of the disease.

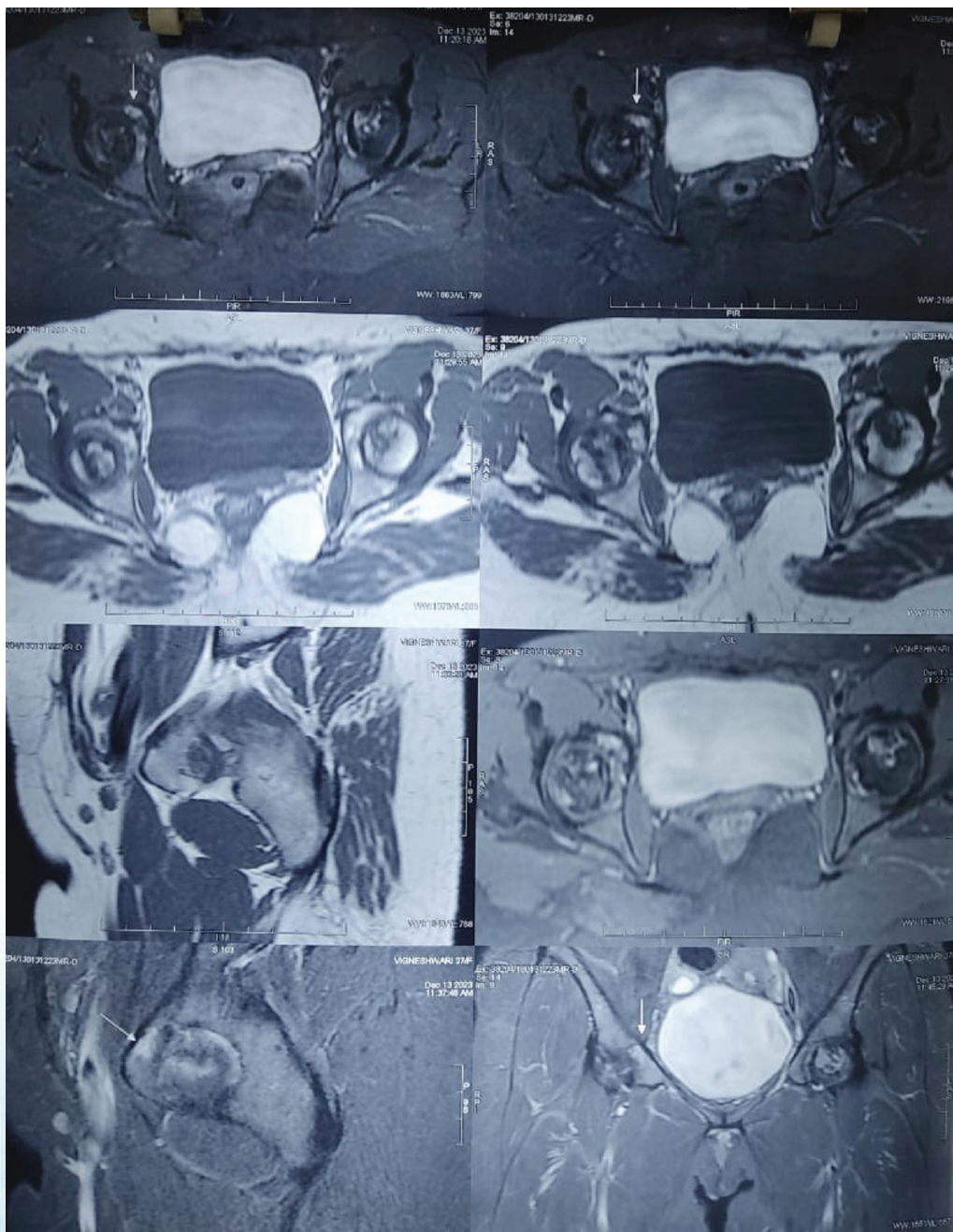


## CONCLUSION

Core decompression augmented with autologous Bone Marrow Aspirate Concentrate [BMAC] injection is an effective treatment option in early stages (pre-collapse) of AVN of femoral head to biologically restore the hip joint. It not only helps in preventing further disease progression but also promotes in healing and regeneration of the osteonecrotic portion of the femoral head.

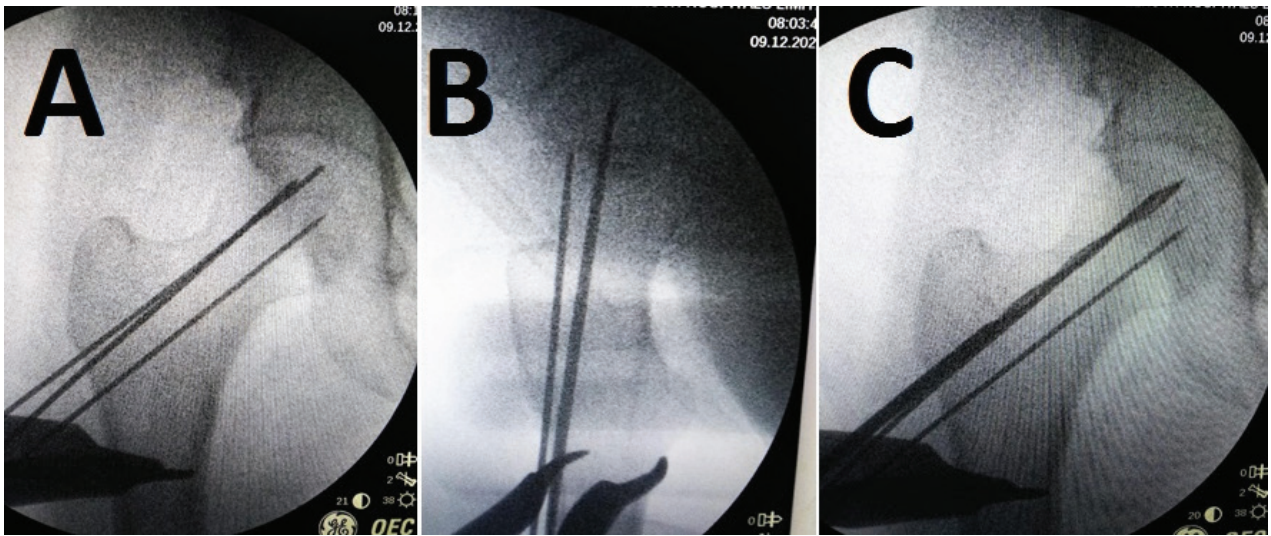
## FIGURE 1

MRI images (axial, sagittal and coronal) showing bilateral AVN of femoral head



## FIGURE 2

Intra-operative C-arm images showing position of guide wires in Antero-posterior [A] and Lateral [B] views for core decompression of femoral head. Figure C showing cannulated drill passing over the guide wire.



## FIGURE 3

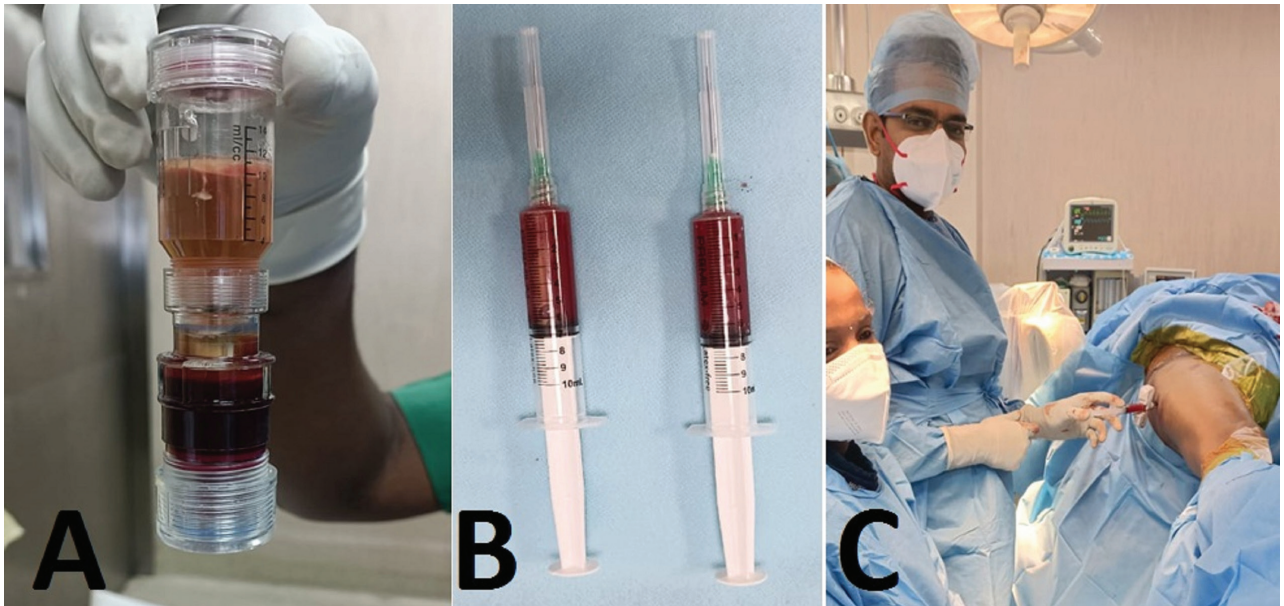
BMA harvested from ipsilateral iliac crest using a bone marrow biopsy needle and 50 ml heparinised syringe





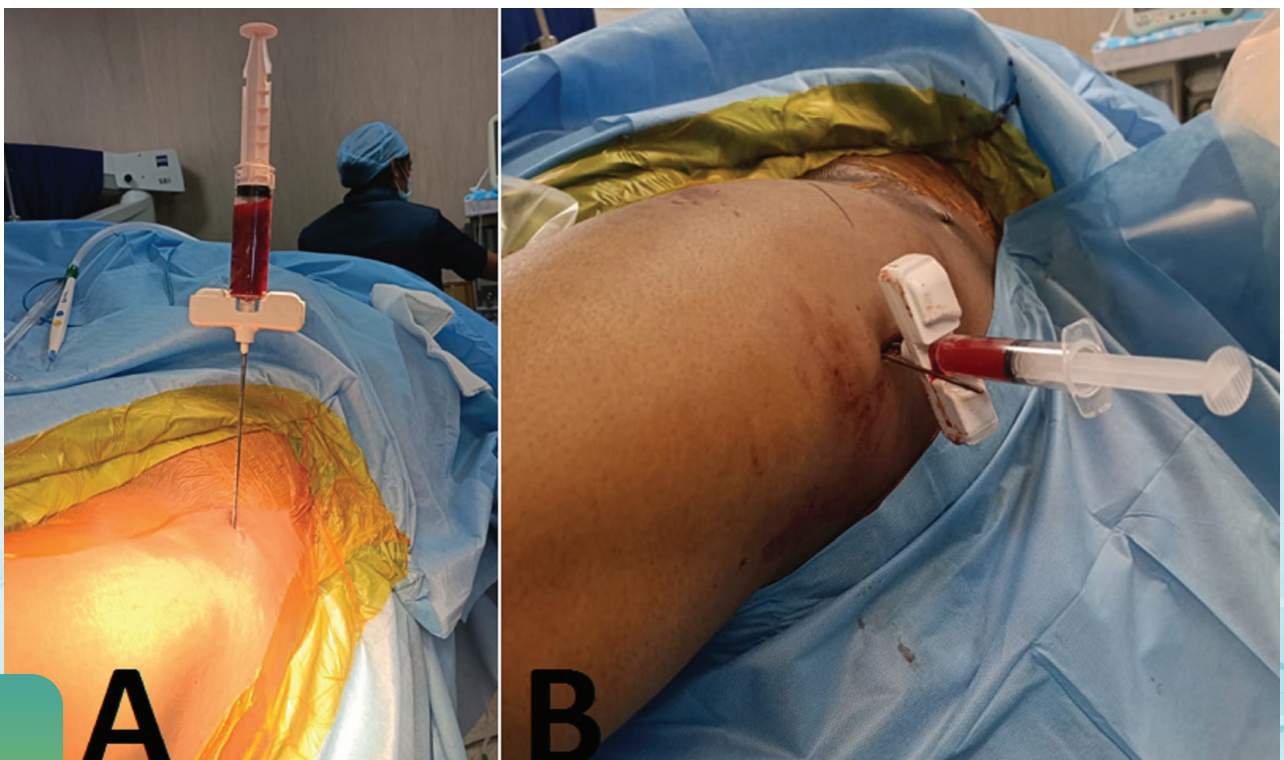
## FIGURE 4

BMAC prepared using specialized commercial extraction kit after centrifuge [A & B] and positioned inside the decompression tunnels prior to injection [C]



## FIGURE 5

Similar procedure of extraction Iliac BMA [A] followed by core decompression and BMAC injection [B] on the left side



# CRUSH INJURY A TALE OF ENDURANCE

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ORTHOPAEDIC SURGEON

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PLASTIC SURGEON

## CASE REPORT 4:

### CASE REPORT

A 50 year old working lady came to our emergency with history of road traffic accident [RTA]. She had a skid and fall from a two wheeler & was subsequently run over by a tractor crushing her left upper limb. She was a diabetic on regular treatment. On examination, patient was conscious and oriented. Tachycardia and pallor were present. Left upper limb was deformed and shortened [Figure 1A]. Proximal forearm was completely exposed with lacerated and contused muscles exposed. Lacerated and thrombosed vessel was seen in the bed [Figure 1B]. Wound contamination was present. Active oozing was present. Left elbow painful crepitus was present with severe restriction of range of movements. Radial pulse was absent. Pin brick bleed and capillary refill were good. Wrist drop was present. Sensation was decreased in hand and forearm. Patient was started on intravenous fluids, broad spectrum antibiotics [Cefoperazone -Sulbactam, Amikacin and Metronidazole], pain killers, antacids and anti inflammatory agents. Blood was immediately sent for surgical pre-operative investigations along with blood grouping and cross-matching. The wound was thoroughly washed and cleaned. Hemostasis was achieved. Sterile dressing was done. Left upper limb was splinted and shifted for radiological investigations once she was hemodynamically stable. CT scan showed comminuted fracture of left distal third humerus along with chip fractures in radial head, coronoid process and olecranon process of ulna [Figure 2A]. CT angiography showed complete occlusion of radial artery from the brachial artery bifurcation for a length of about 4 cm with retrograde filling of the mid and distal radial artery through the palmar arch [Figure 2B]. There was additional occlusion of the superior ulnar collateral artery for a length of 8 cm from the origin at the medial aspect of the upper brachial artery. Patient was taken up for emergency surgical debridement with temporary trans-articular external fixation of the left upper limb with the aid of the plastic surgery team [Figure 3A &B]. The wound was thoroughly debrided and hemostasis was achieved. Copious saline lavage was given. Among the forearm muscles - Pronator teres, Extensor carpi radialis longus, Brachioradialis and Flexor carpi radialis muscles were found avulsed from origin. They were repaired locally [Figure 3C]. Proximally cut distal end of radial artery was explored, identified and tagged with a 4-0 prolene suture. Patient needed four units of packed cell transfusion during the surgery and in the immediate post operative period for hemodynamic restoration. Postoperatively, a customized dynamic wrist drop (cock up) splint was given to aid in recovery of wrist drop [Figure 3D]. Daily wound dressing was done at bed side. After one week, wound healing was not satisfactory. Wound started showing signs of ischemic necrosis of skin with demarcation. [Figure 4A &B] Slough was present in muscle bed suggesting infection. Hence patient was taken up for second look surgical wound debridement [Figure 4C] and vacuum assisted closure [VAC] device application [Figure 4D]. Post-operatively, wound swab showed growth of gram negative bacilli- Escherichia coli, which was treated with sensitive antibiotics [Cotrimoxazole & Linezolid]. Patient's hemoglobin dropped - necessitating two units of packed



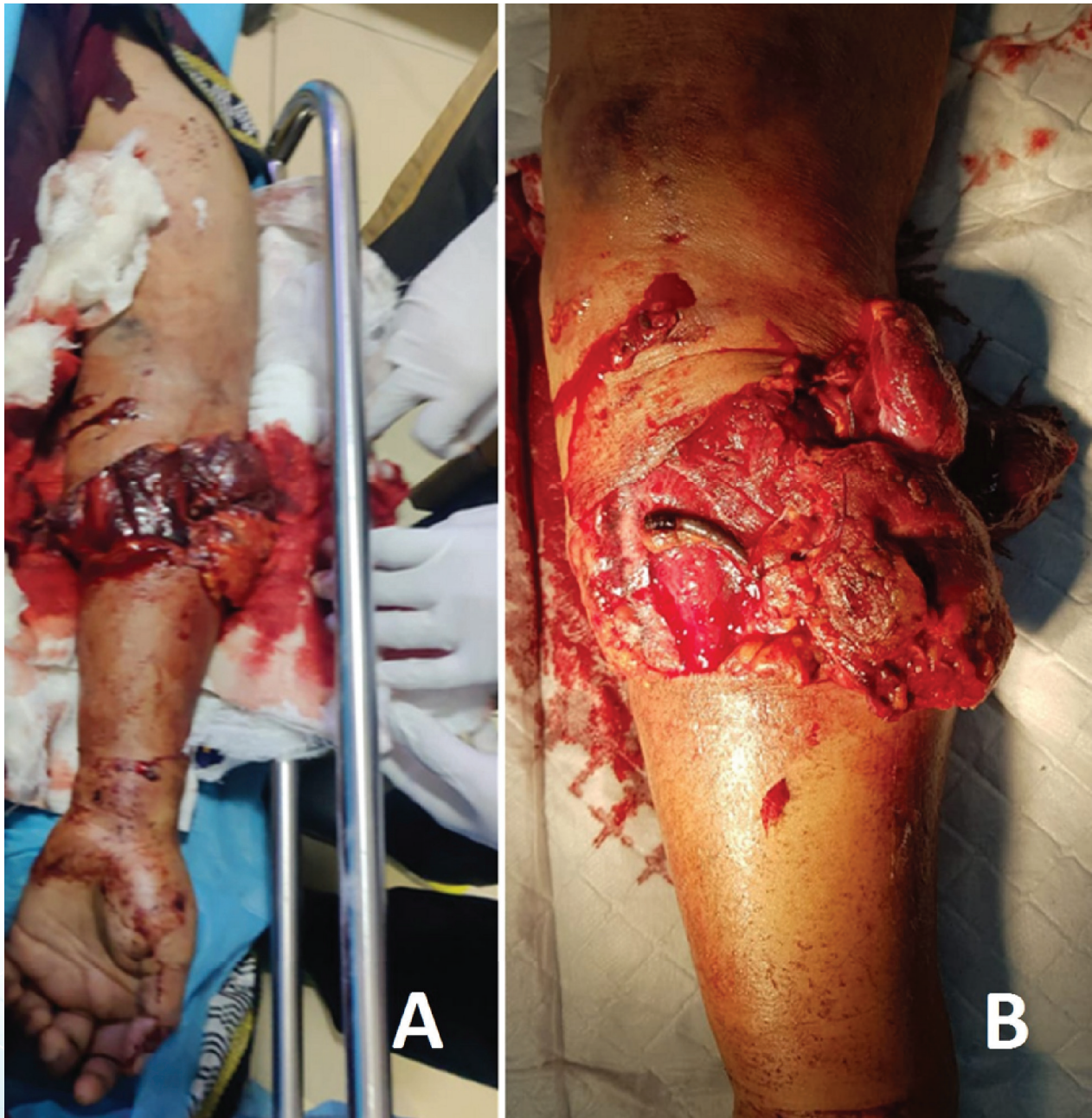
cell transfusion. Serial wound dressing and meticulous VAC care was given. After three months, wound was found healthy, without any slough, showing good signs of healing [Figure 5]. Patient was taken up for a Latissmus dorsi [LD] myocutaneous flap and split skin grafting [SSG] for wound cover by the plastic surgery team [Figure 6 & 7]. Post-operatively, on serial wound inspection, flap margins were looking devitalized. Patient needed wound debridement and flap readjustment surgery twice, one month apart. Subsequently, the flap settled and healed well [Figure 8A-C]. Meanwhile, the patient developed pin tract infection at the site of humeral external fixation pins leading to pin loosening. The external fixator was removed and the pin tracts were debrided and an above elbow plaster was given [Figure 8D]. The cast was removed once the pin tracts were healed and the patient was planned for open reduction and internal fixation [ORIF] of 5 month old non union of distal third humerus fracture. The fracture site was freshened and osteosynthesis was achieved using anatomical extra-articular metaphyseal distal humerus locking plate along with iliac crest cortico-cancellous bone grafting [Figure 9A & B]. The fracture united well with the radiographic evidence of good callus formation at one year follow up [Figure 9C & D]. At the end of one year, after enduring six surgical procedures, patient had an excellent clinical, radiological and functional outcome [Figure 10A-E]. Her skin and soft tissues healed thoroughly. With continuous physiotherapy, she regained her muscle strength gradually and her wrist drop improved. She was completely pain free, able to do all her day to day activities independently without any restriction including cooking at home, driving a two wheeler and resuming her office job.

## CONCLUSION

Successful clinical outcome in a traumatic crush injury calls for a well co-ordinated multi-disciplinary team effort involving various specialities - emergency team, nursing staff, radiology, orthopaedic and plastic surgery team, diabetologist, anaesthetist and OT staff, laboratory team, microbiologist, blood bank, hospital management, physiotherapy, orthotist and rehab personnel. Above all, without the unwavering trust and co-operation of the patient, none of these could be achieved.

## FIGURE 1

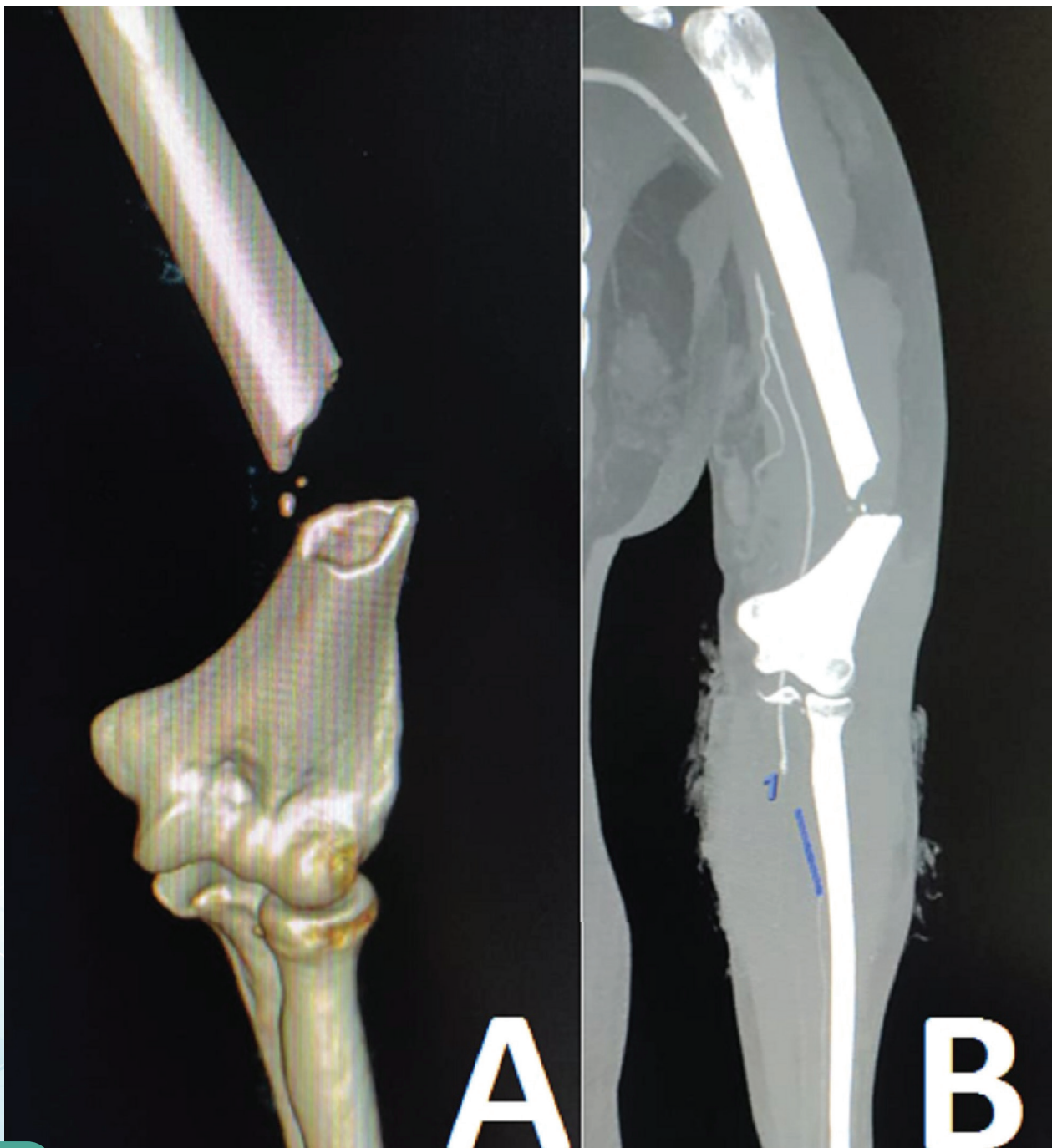
Clinical picture showing crush injury of left upper limb [A]. Lacerated and thrombosed vessel seen among the crushed forearm muscles [B]





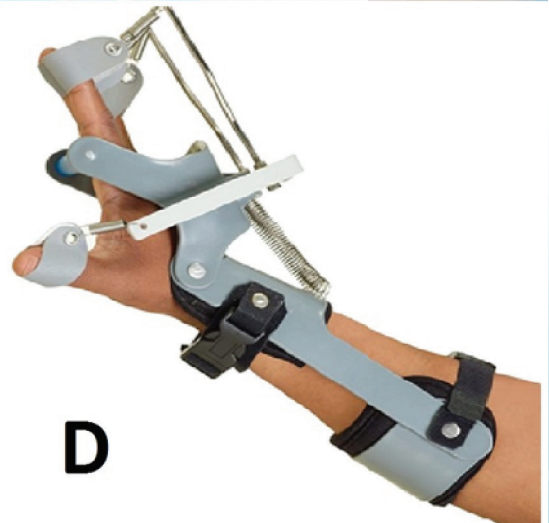
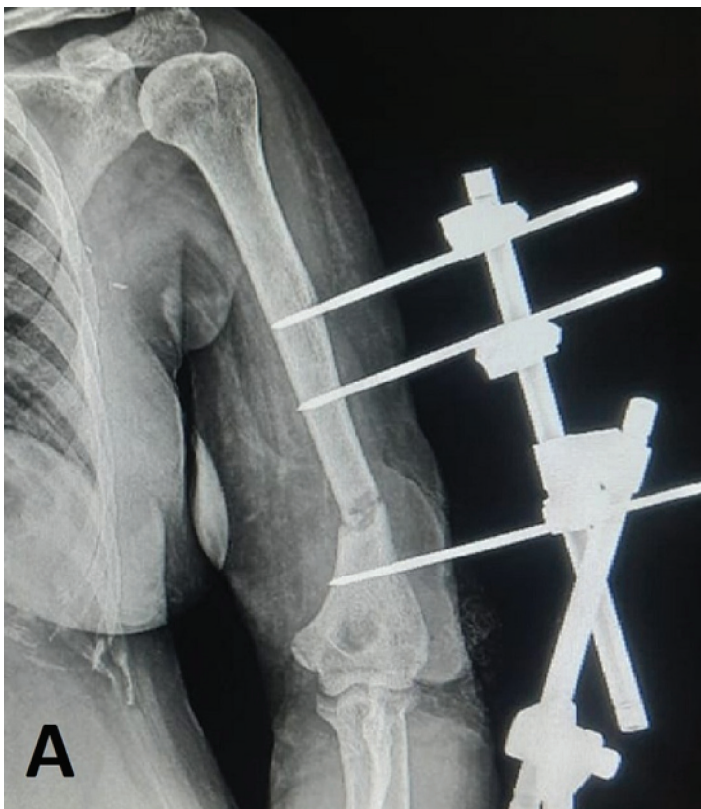
## FIGURE 2

CT scan showing fracture of distal third of humerus [A]. Corresponding CT angiogram of the left upper limb shows complete occlusion of radial artery from the brachial artery bifurcation for a length of about 4 cm with retrograde filling of the mid and distal radial artery through the palmar arch.



### FIGURE 3

Post operative radiograph [A] and Intra-operative picture showing external fixation of distal humerus fracture. Intra- operative photographs showing lacerated forearm muscles after thorough debridement [C]. Dynamic cock up splint [D] was applied to the patient post operatively to aid in recovery.





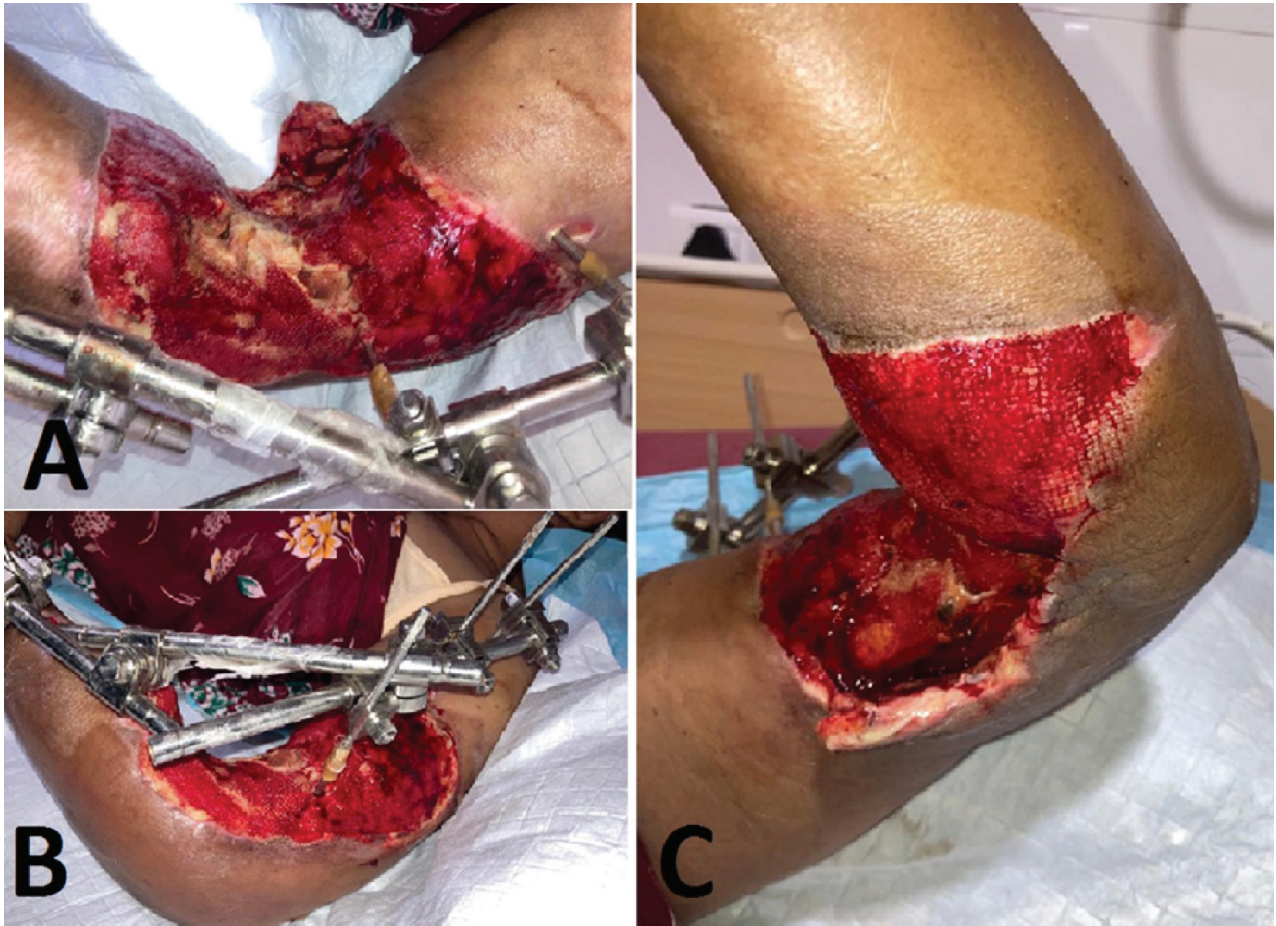
## FIGURE 4

Post operative wound infection [A & B], treated with debridement [C] and VAC [D] application



## FIGURE 5

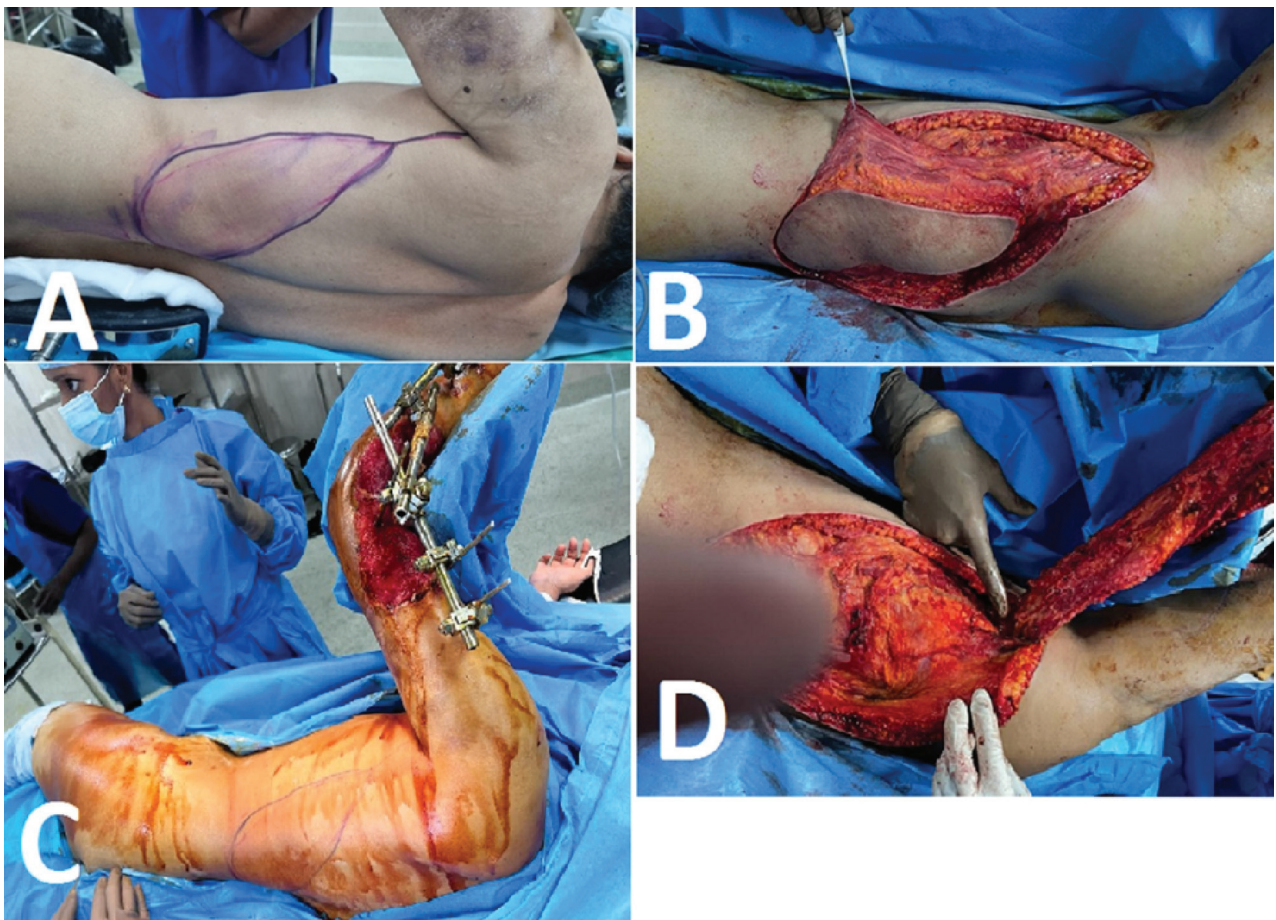
Post VAC application healing status of the wounds [A-C]





## FIGURE 6

Skin marking for LD myocutaneous flap harvest [A]. Patient position during the surgery after painting and draping [C]. LD muscle harvested with the pedicle [B] and tunneled through the axilla [D] to reach the target site in the arm.



## FIGURE 7

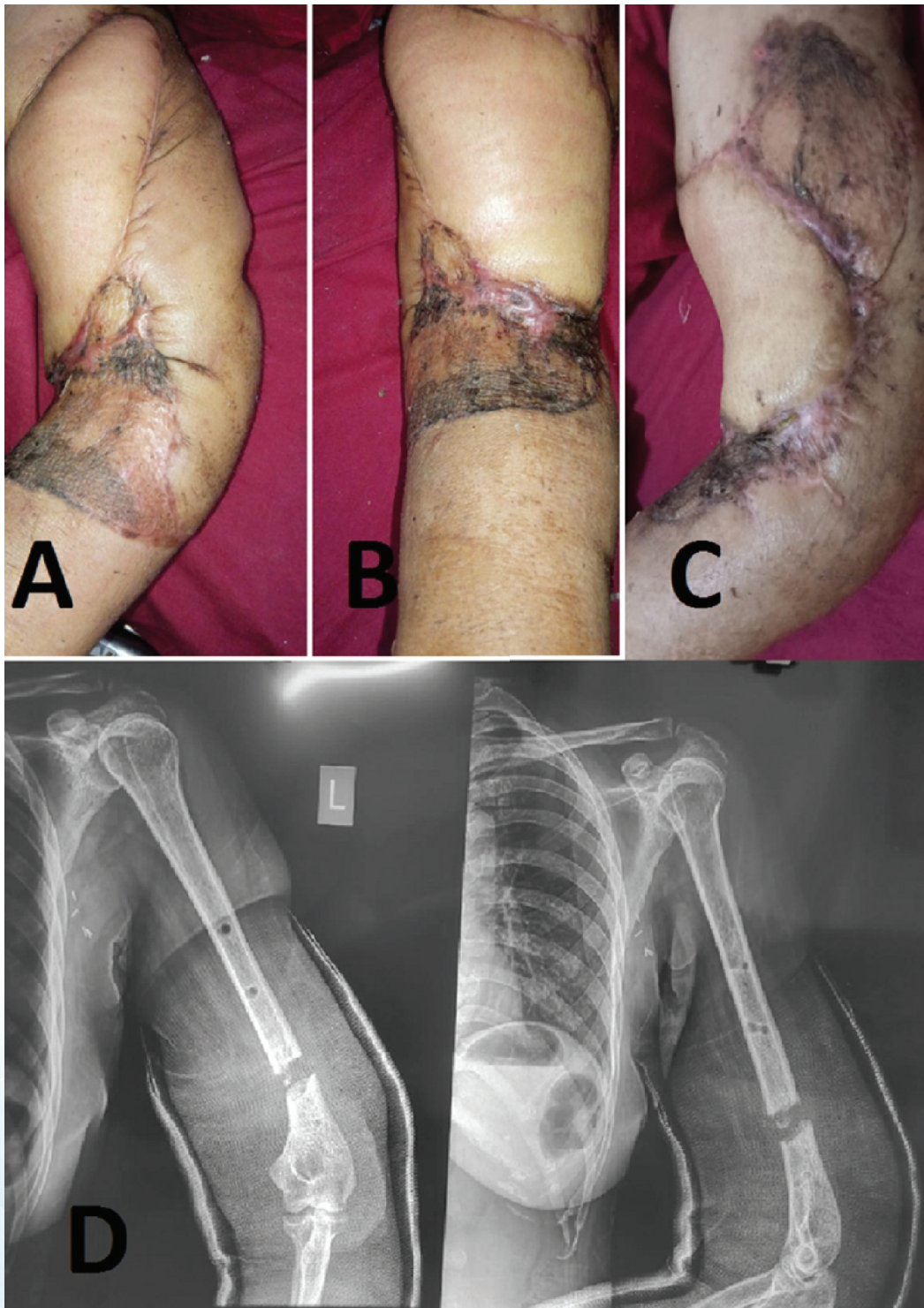
Final intra-operative pictures showing raw area in left upper limb covered with LD myocutaneous flap cove and SSG [A&B] and primary suturing of the donor site [C]





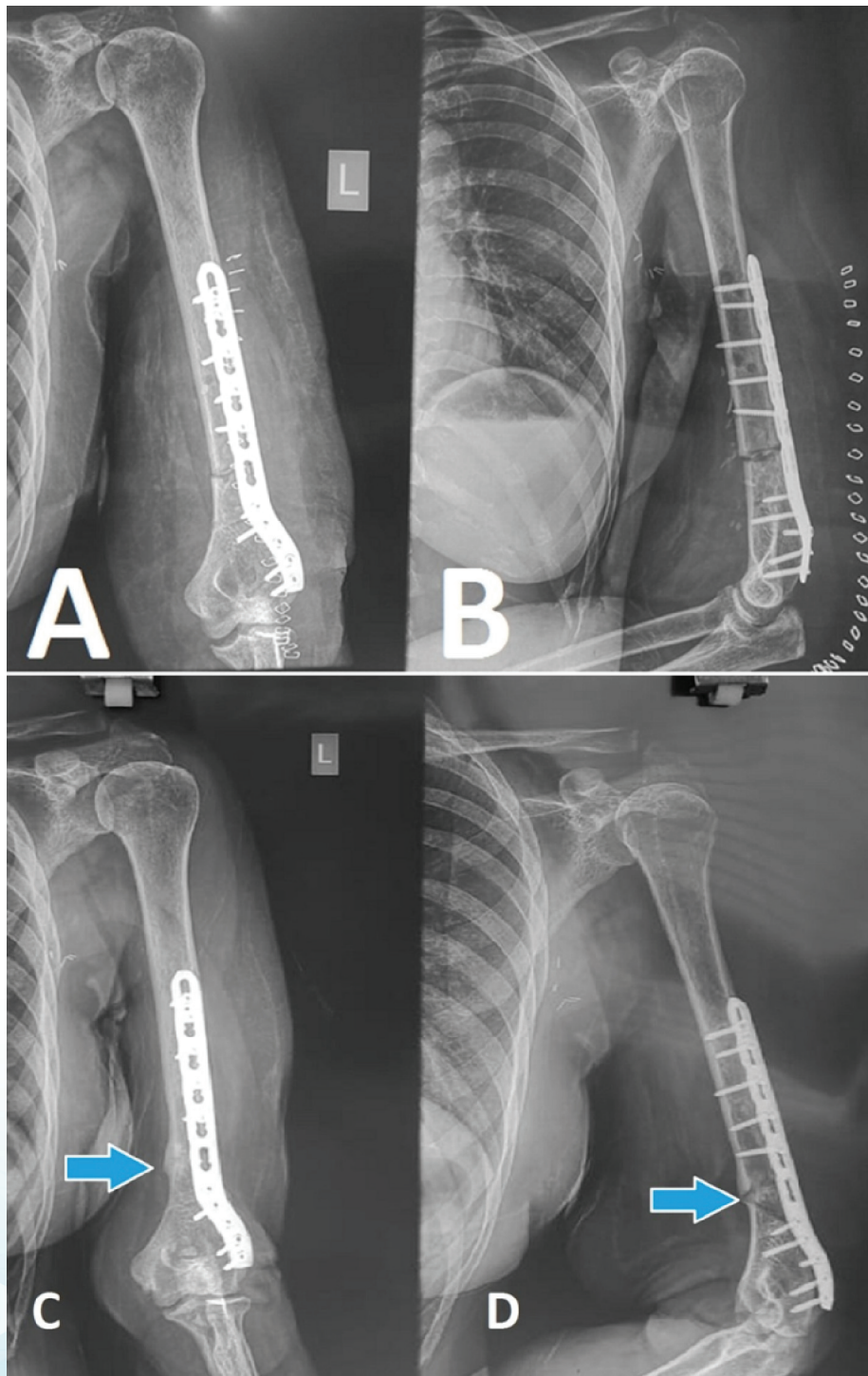
## FIGURE 8

Clinical photograph showing complete healing of the flap and SSG [A-C] . Plain radiograph after external fixator removal and cast application showing non -union of humeral fracture



## FIGURE 9

Immediate post operative Ap and lateral radiographs after Osteosynthesis and bone grafting of distal humeral fracture with anatomical titanium plate [A]. One year post operative follow up AP and lateral radiographs [B] showing callus formation [blue arrows] and bony union





## FIGURE 10

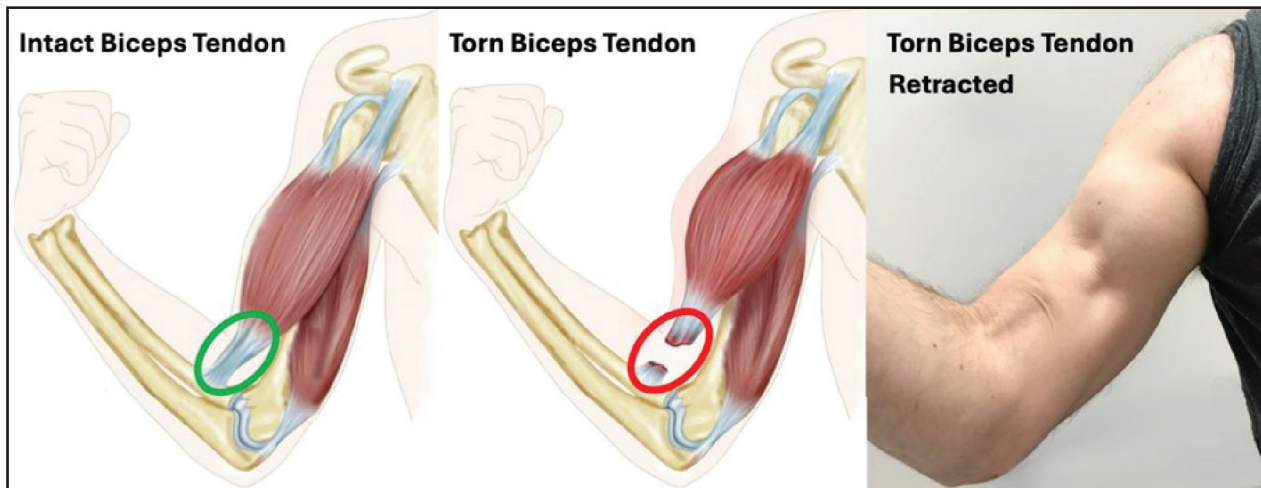
One year follow up clinical pictures showing excellent functional restoration of elbow and shoulder range of movements [A-C] with complete healing of skin and soft tissues around elbow [D&E].



# DISTAL BICEPS TENDON REPAIR BY DOUBLE INCISION TECHNIQUE AND TIGHT ROPE BUTTON

-DR.A.DORAIRAJAN CONSULTANT ARTHROPLASTY, ARTHROSCOPY AND TRAUMA SURGEON

## CASE REPORT 5:



Distal biceps tendon rupture can be complete avulsion or partial detachment from the lateral side of the radial tuberosity. Rupture of the proximal biceps tendon can be treated conservatively, while injury to its distal attachment usually needs surgical intervention. If not treated can cause persistent pain and forearm supination weakness. Patients generally recover successfully if they receive a timely diagnosis and treatment.

### MECHANISM OF RUPTURE:

Distal biceps rupture is from the excessive eccentric force as the arm is brought into extension from flexion. These activities include weightlifting, wrestling, and labor-intensive jobs.

**Risk factors** include age, smoking, obesity, use of corticosteroids, and overuse. Rare causes include the use of quinolones, diabetes, lupus, and chronic kidney disease.

**The incidence** of distal biceps tendon rupture is around 2.55 per 100,000 patient-years. Most patients (more than 95%) are males, and injury events usually happen during middle age (35 years to 54 years). The rupture of the distal biceps mainly involves the dominant limb.

**PRESENT CASE**, 42 years old regular weight lifter Gym, while doing work out heard a "pop" sensation in his left elbow.. He presented with pain and swelling in the elbow.

**ON CLINICAL EXAMINATION** there was ecchymosis in the elbow (cubital fossa). There was tenderness over the distal biceps insertion area. He had pain on flexion and supination of elbow.

**Clinical diagnostic tests** are only for academic purpose as invariably they are difficult to perform due to swelling and in apprehensive patient.



**Hook Test:** The examiner uses his index finger to hook it around the lateral edge of the biceps tendon while the patient is actively flexing and supinating the elbow. If the examiner can hook his finger 1 cm underneath the tendon, the test is positive, and the tendon is intact. A false-positive test can present in a partial tear or when lacertus fibrosus or underlying brachialis tendon are misinterpreted as an intact biceps tendon.

**Ruland Biceps Squeeze Test:** It is performed with the elbow supported in 60 to 80 degrees of flexion, and the forearm is pronated. Then the examiner squeezes the distal biceps muscle belly. The test is positive when there is no supination of the patient's forearm or wrist.

## DIAGNOSTIC IMAGING:

**Radiographs** generally cannot aid in diagnosis; occasionally can show a small fleck of bone from the radial tuberosity. Radiographs can be helpful to survey for other accompanying conditions, confirm the absence of another bony pathology, or sometimes reveal radial tuberosity hypertrophy or occasional avulsion fracture of the tuberosity.

**MRI** is rarely necessary for diagnosis, but it is helpful to distinguish between the following:

- Complete versus partial tear
- Muscle substance versus tendon tear
- Degree of retraction

**Ultrasound** is a useful, inexpensive. Non-invasive tool to identify the absence of tendon. Although it is operator dependant, it can give all the information needed to make a decision on treatment.

**IN THE PRESENT CASE,** The x rays were normal. With clinical diagnosis of distal biceps rupture in mind, ultrasound was done by a sonologist. The diagnosis was confirmed with additional information of tendon retraction proximally. MRI was not done as sufficient information was already available.

[48/M]	DATE: 04.04.2024
Ref. By: Dr. A. DORAIRAJAN	UHID.NO: 50004926
<b>USG - LEFT ELBOW</b>	
<b>FINDINGS:</b>	
Near complete avulsion of biceps tendon from its insertion site with retracted tendon noted just above the level of elbow.	
Brachial artery appears normal.	
DR.KIRAN KUMAR., DNB (RD), FVIR., Reg.NO: 112727	DR. N. KARTHIKEYAN., (DNB) (Reg. No. 140775)
RADIOLOGISTS	

## TREATMENT:

### CONSERVATIVE:

Patients with low physical demands and multiple comorbidities are more suitable for conservative treatments. Any patient who opts for conservative management of distal biceps tendon rupture needs to be counselled about the outcomes with 50% loss of sustained supination strength, 40% loss of supination strength, 30 % loss of flexion strength, and approximately 15% loss of grip strength

### SURGICAL:

Indicated in young and active individual unwilling for conservative treatment and helps in rapid return to sports.

It is favoured for regain of maximum strength of forearm supination power and effectively relieve pain in the cubital fossa.

**IN THE PRESENT CASE,** Considering the patient profile, surgical treatment was suggested. Patient also preferred surgical repair.

**Surgical repair** can be done by anatomic or non-anatomic, single incision or double incision technique. Anatomic meaning repair back to the attachment site at radial tuberosity. Non-anatomic meaning suturing to brachialis muscle. Single incision uses an incision over the cubital fossa and lateral antebrachial cutaneous nerve is at risk with this approach. If the cut end of the tendon is retracted proximally then one has to opt for double incision technique.

**Fixation techniques** are done with either of these, bone tunnels, suture anchors and cortical button. Cortical button compared to other two methods is stronger, has highest failure load and pull-out strength.

#### PRESENT CASE SURGICAL TECHNIQUE:

**Double incision technique for approach and fixation method with adjustable loop tight rope button.**

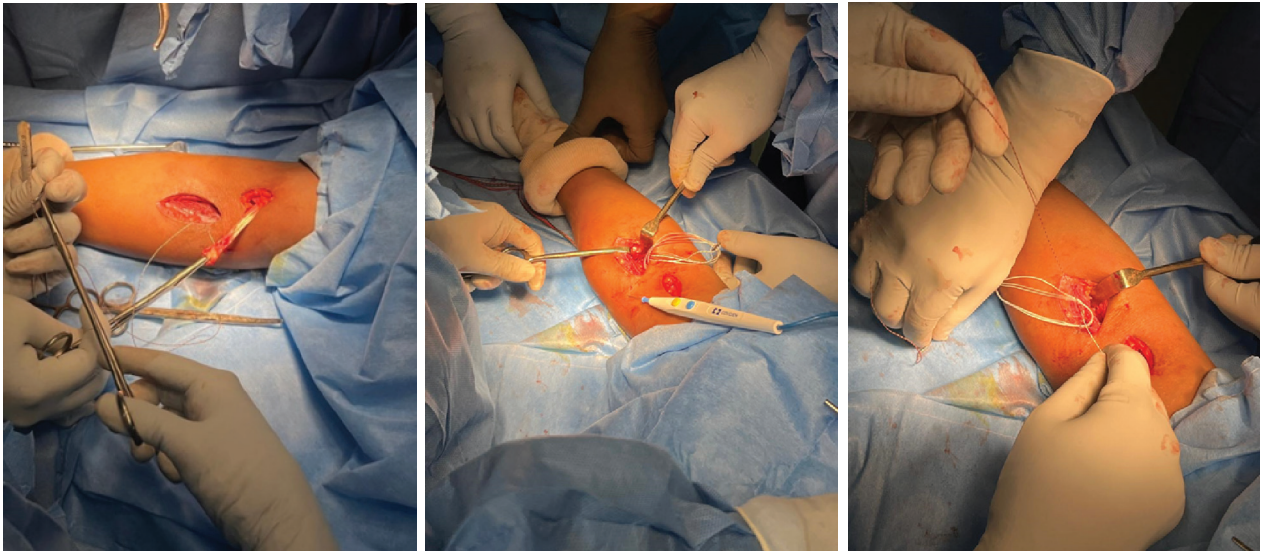
Patient on supine position, without tourniquet, double-incision technique was done. Distal incision was placed in cubital fossa at the attachment of biceps tendon, proximally it was placed above elbow at the level of retracted tendon below the belly of biceps muscle.

Deeper dissection was done to expose the bicipital tuberosity of radius. The lacertus fibrosis was torn, so the distal end of the tendon got retracted proximally. Therefore a proximal incision was done to retrieve the distal end of the tendon.

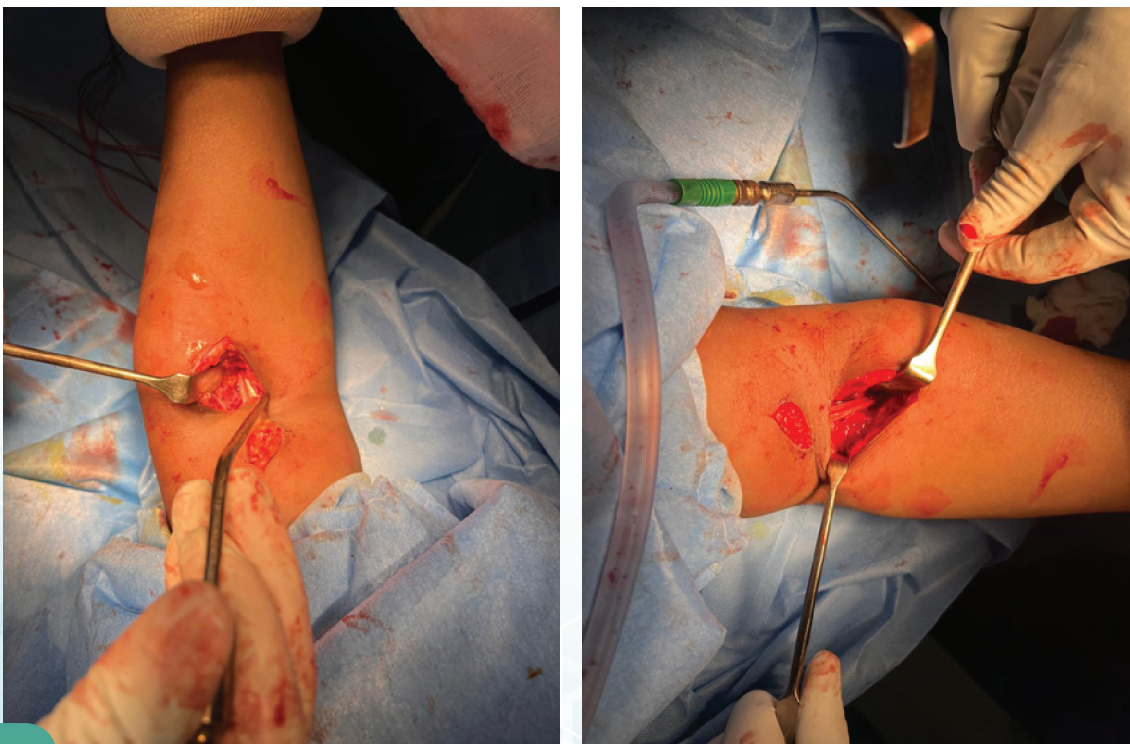




The distal end of the tendon was sutured by no 2 fiber wire in Krackow fashion and routed into the distal incision. The fiber wire is attached to adjustable loop tight rope button.



The button is threaded through the tunnel made in bicipital tuberosity and flipped on the other side. The tight rope is tightened till the tendon end is buried inside the tunnel. An additional incision is made on the posterior aspect to facilitate the knot tying.







Skin sutured with Ethilon. Post-op immobilization was done by arm sling with elbow in 90 degree flexion. Postop x ray is taken to confirm the position of the cortical button.



The patient was encouraged to do active flexion, extension within short range initially then slowly increased over time avoiding extreme range.





After 6 weeks, full flexion and extension was allowed. He was not allowed to lift weight until 3 months.

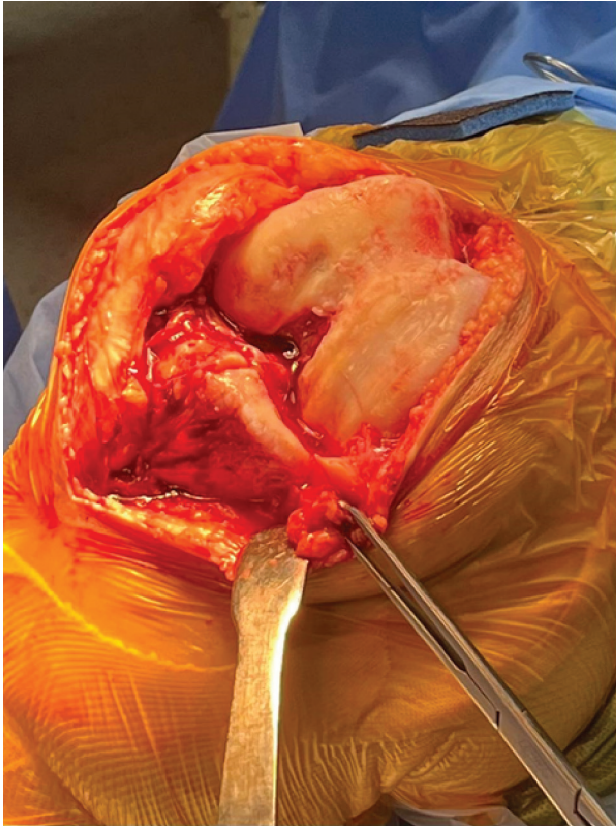
Patient regained full movements after 6 weeks and now at 6 months started weight lifting in the gym.

## **SUMMARY:**

Acute distal biceps tendon rupture usually occur in young people following eccentric load failure. It is more of clinical diagnosis which is confirmed by ultrasound test. Acute rupture in young individual is better treated by surgical repair for maximum regain of power in the elbow and rapid return to sports.

# TOTAL KNEE REPLACEMENT A BOON OR BANE?

**-DR.A.DORAIRAJAN** CONSULTANT ARTHROPLASTY, ARTHROSCOPY  
AND TRAUMA SURGEON



Total knee replacement (TKR) is considered as a successful and cost-effective surgery for the treatment of severe arthritis of knee for over 5 decades. It has profoundly transformed the lives of many patients with severe arthritis. The quality of life (QOL) of the affected patients has vastly improved after TKR. The success story has been very well documented in the medical literature. Inspite of the benefits, there is unstisfaction rate of 20% among TKR patients from various studies.



TKR has some setbacks such as surgical complications, long recovery period, high costs, activity limitations and not a cure-all solution. So TKR is still considered as a last sought out option for end-stage arthritis after all the other modalities of treatment proved to be futile.

There are some misconceptions about knee replacement surgery such as Believing it's only for the elderly, that the success rate is low, the surgery is extremely painful, that it will severely limit mobility after surgery, that you should delay the procedure as long as possible and that the bending the knee will be difficult post-operation. It is not uncommon to see many of our Indian patients with severe OA with deformities and walking with waddling gait and withstanding severe pain and trying hard to postpone the surgery. So after all of these pros and cons, is TKR still worth considering for patients suffering from severe painful arthritis?

The present prevalence of knee OA in India is around 28.7% and is increasing. The higher incidence is observed in females and obesity, older age and sedentary lifestyles. In India, due to limited access to quality healthcare, particularly in rural areas, delayed diagnosis and treatment, lack of awareness and procrastination of early treatment are the factors responsible for severe deformities such as varus, valgus, flexion and recurvatum.

It is well known fact that after prolonged period of treatment neglect, many patients develop secondary problems in the spine like degenerative spinal canal stenosis. One problem leading to another. Therefore, it is imperative to treat one problem at early stage to prevent other problem from developing. The early correction of knee deformity not only helps in restoring biomechanics of gait but also prevents permanent gait disturbance.

We have some patients with severe OA knee with deformities and severe symptoms like pain, unstable gait, and inability to walk without any aid. All these patients, TKR has provided them both relief of pain symptoms and the ability to regain function back to their previous life style. It is understood that the TKR knee does not behave like a normal knee. That is the reason why some people are not satisfied with the outcome. The satisfaction after surgery can vary with different patients depending on their demographic status, prior expectations and physical demands.

The following are few representative difficult cases from my TKR series in Billroth hospital.

## CASE REPORT 6:

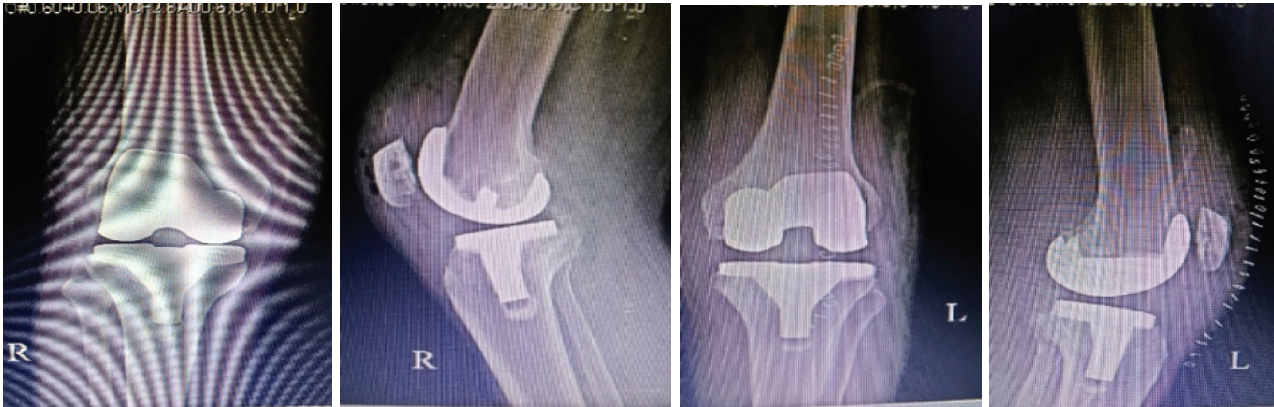
70yrs old 6 foot tall Gentleman of African descent was suffering from severe OA Grade IV knees (Kellgren-Lawrence) with pain and inability to walk for more than 10 years. His both knees had severe varus and flexion deformities. He can BARELY STAND FOR FEW MINUTES AND WALK without an external support. He came for consultation with the hope of getting rid of pain and being able to walk after surgery. He had no medical co-morbidities. After taking into consideration of his good physiological status despite his age, simultaneous TKR was planned for both knees. During the surgery, both the deformities were corrected with great difficulty. It was a technically demanding surgery due to severe deformities in both knees. In the 2nd post-operative period he was able to stand and walk the next day with external support. Subsequently after 2 weeks of stay at the hospital, he went back to his country and he was very pleased with the outcome which are pain-free and ability to walk without pain.

### PRE-OP X RAYS:





## POST-OP X RAYS:



## BEFORE AND AFTER TKR:



## CASE REPORT 7:

56 years old Lady having severe Bilateral Grade IV OA with varus and flexion deformities, severe pain and physical inability to walk on her own without external support for more than 8 years. She also did not have medical co-morbidities, so taking into account her well preserved physiological status bilateral simultaneous knee replacements were successfully done. In the post-operative period her OA pain has disappeared and she was able to walk with ease and her physical disability has become a thing of the past.

### WALKING AID BEFORE AND NO WALKING AID AFTER BILATERAL TKR





## POST-OP KNEE ALIGNMENT:



## PRE-OP X RAYS



## POST-OP X RAYS



## CASE REPORT 8:

43 Years young Lady with Rheumatoid arthritis affecting both the knees causing severe valgus deformity and pain. For her every day starts with pain and continue throughout the day. Irrespective of her young age, the disability and suffering was the main reason for her opting for TKR. The bilateral simultaneous TKR was considered as she had equally severe symptoms in both knees. After the surgery her pain in the knees has become obsolete and she is able to walk without any walking aids subsequently.

### PRE-OP X RAYS



### POST-OP X RAYS AND LEG ALIGNMENT





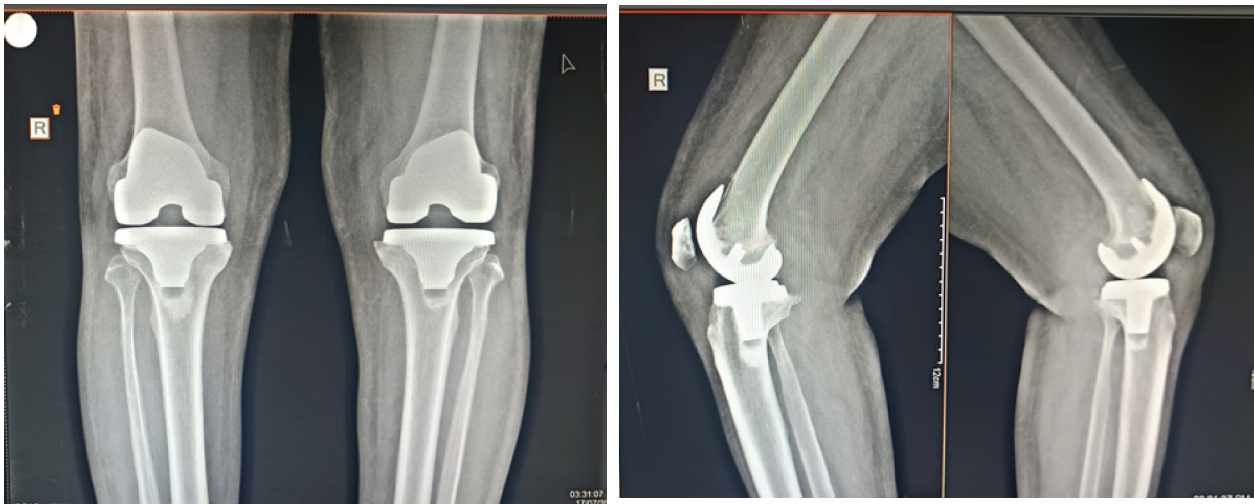
## CASE REPORT 9:

70 Years old man bilateral severe Grade IV OA knees with varus deformity presented with severe pain and limitation of movements for 2 years. His physiological status was fit and he had severe disease in both knees so simultaneous Bilateral TKR was done. After the surgery he was relieved of his pain and could walk unaided.

### PRE-OP X RAYS



## POST-OP X RAYS:



## LEG ALIGNMENT BEFORE AND AFTER TKR

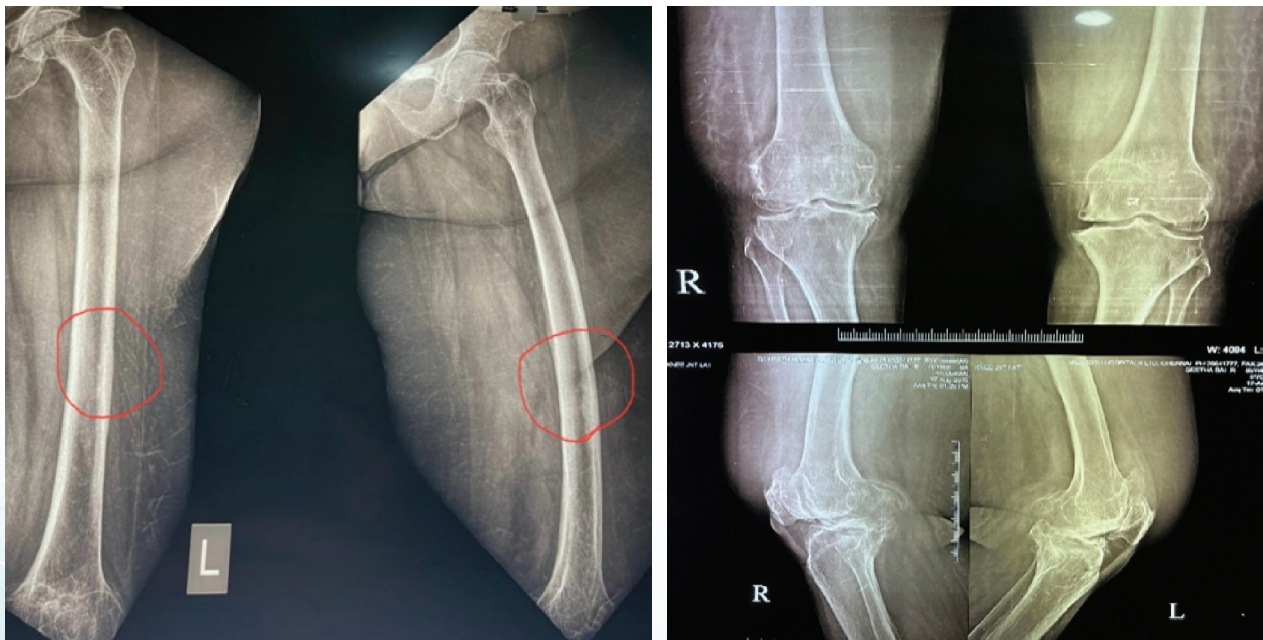




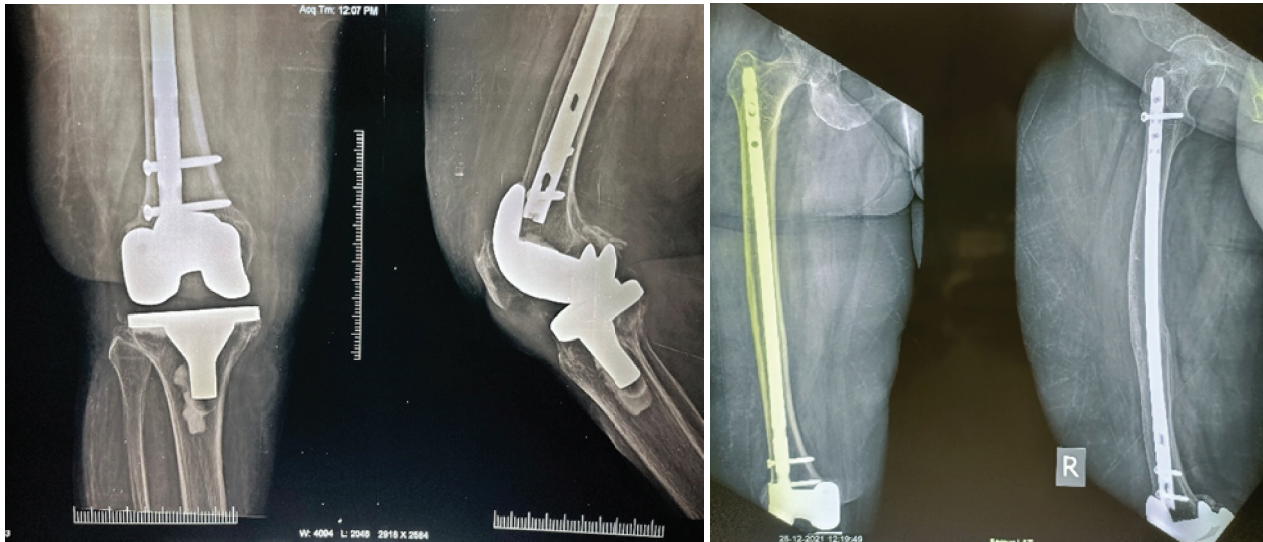
## CASE REPORT 10:

67 years old Lady had severe Grade IV OA knees with varus deformity of 2 years duration. She developed acute onset of pain in her right thigh. There was no history of fall or injury. The x rays showed very subtle stress fracture of femur junction middle and lower third in addition to severe OA both knees with severe varus. The stress fracture was verified with a CT scan. It was imperative that treatment for both stress fracture and OA knees had to be done at the same time. So in addition to TKR, the stress fracture was also fixed using an intramedullary nail above the prosthesis. There was a plan to do TKR for the other side a week later. But she developed Pulmonary embolism(PE) in the 4th post-op day which was quickly recognized and promptly treated with anti-coagulants. Due to this unexpected event her mobilization was delayed. She was under anti-coagulant (warfarin) for 6 months. Subsequently after 6 months the other side TKR was done, this time with uneventful post-op. At present she is able to walk on her own without any support and very pleased with the outcome of both surgeries. This case is an example of a major complication like PE after TKR where it was identified at the right time and treated promptly. Though this is not a common complication (0.01% to 0.4%) after TKR, awareness of these possibility should always be kept in mind.

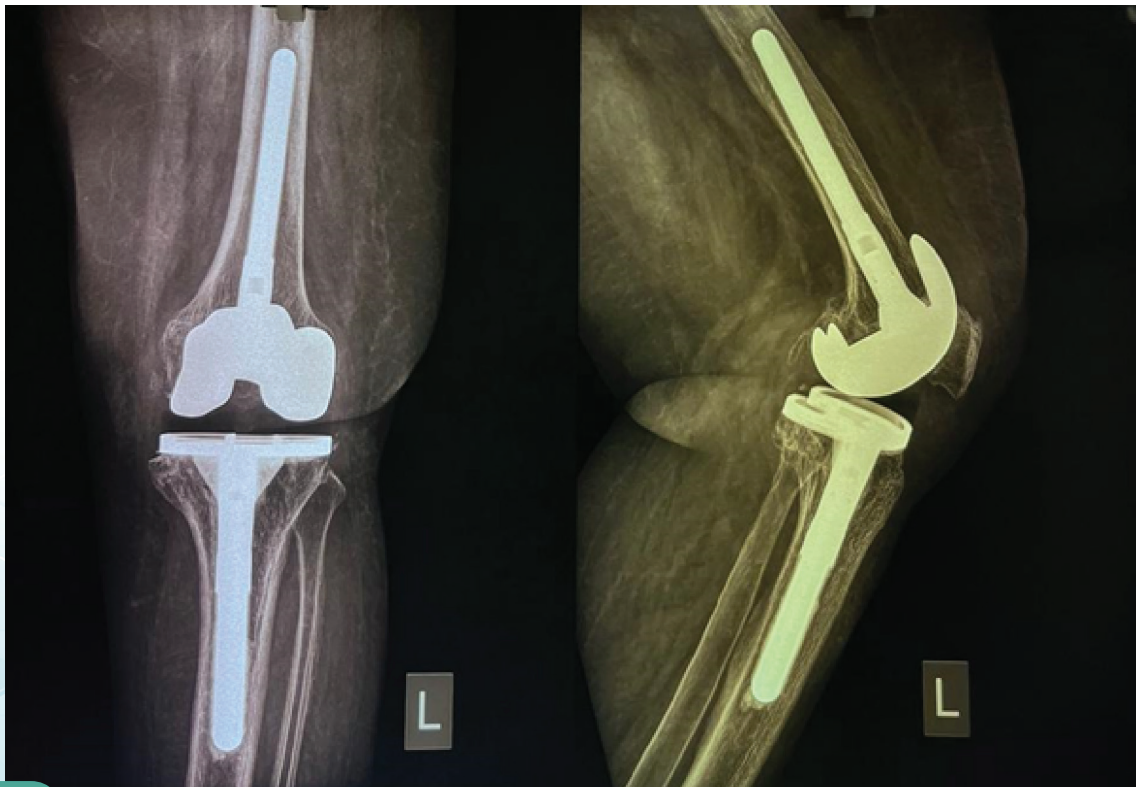
### PREOP X RAYS SHOWING VERY SUBTLE STRESS FRACTURE AND SEVERE OA GRADE IV (K-L)



## POSTOP X RAYS SHOWING TKR AND INTRAMEDULLARY NAILING FEMUR ON THE RIGHT KNEE:



## POST-OP X RAY WITH LONG STEMMED TKR LEFT KNEE:





## IMPROVED ABILITY TO WALK WITHOUT ANY SUPPORT AFTER SURGERY



Out of 3600 TKR cases since I began my career as arthroplasty surgeon in 1994, there are few complications overall like infection (2), delayed wound healing (4), postoperative excessive bleeding due to LMWH (8), loosening of prosthesis (2), postoperative knee stiffness(2), PE (1), mortality due to MI (1), periprosthetic femur fracture 2 years after surgery (1), persistent pain (4)

## CONCLUSION:

The TKR has a success rate of 90% in patients experiencing significant pain relief, improved function, improved quality of life. So it is considered a BOON for patients who suffer from severe pain and disability due to knee arthritis. However, it is not without potential complications and risks though a low percentage which can make it a BANE for certain cases and also in patients with unrealistic expectations about the outcome of surgery. So Knee replacement can be either be an outright BOON or a BANE. Patients must weigh the potential benefits against the possible drawback and make an informed decision in consultation with medical experts. Doctors should follow strict selection criteria for choosing patients for surgery. With proper care and realistic expectations, TKR patients can enjoy a greatly improved quality of life.

# FREIBERG'S DISEASE: A NOVEL MIS APPROACH

**-DR.T.V.RAJA** D.ORTHO,M.CH(ORHTO),DIP IN FOOT SURGERY (FRANCE)  
CONSULTANT ARTHROSCOPIC, ARTHROPLASTY AND TRAUMA SURGEON

## CASE REPORT 11:

### INTRODUCTION

Freiberg's disease is a rare orthopedic condition that affects the metatarsal bones of the foot, particularly the second metatarsal head.

It is characterized by infarction, aseptic necrosis, and eventual collapse of the affected bone, leading to pain, deformity, and osteoarthritis (OA).

This disease primarily affects adolescents, especially female athletes, due to stress and microtrauma on the foot during rapid growth phases.

### EPIDEMIOLOGY

- Freiberg's disease predominantly affects females, with a female-to-male ratio of approximately 4:1.
- It is most commonly seen in individuals between the ages of 13 and 18.
- The condition is frequently observed in the second metatarsal head, particularly in patients with an elongated second metatarsal.
- The fourth and fifth metatarsals are rarely involved.

### ETIOLOGY AND PATHOPHYSIOLOGY

The exact cause of Freiberg's disease is not fully understood, but it is believed to be associated with:

- Repetitive microtrauma and weight-bearing stress leading to disrupted blood supply.
- Osteonecrosis, which weakens the bone structure and makes it prone to fractures.
- Progressive joint degeneration, where the metatarsophalangeal (MTP) joint becomes incongruent, eventually leading to osteoarthritis.

The disease progresses through multiple stages:

1. Subchondral fractures are visible only on MRI.
2. Dorsal collapse of the articular surface becomes evident on plain radiographs.
3. The dorsal portion of the metatarsal head collapses while the plantar side remains intact.
4. The entire metatarsal head collapses, leading to joint space narrowing.
5. Advanced osteoarthritis with joint space obliteration

### CLINICAL PRESENTATION

This 30 year old lady

- present with forefoot pain, swelling, and stiffness localized to the second metatarsal head.
- Pain is exacerbated by weight-bearing activities and relieved with rest.
- stiffness of 2 nd MTP joint was present
- The affected metatarsal head appears enlarged, tender, and irregular on palpation, with periarticular swelling.
- Hyperextension deformity of the 2nd mtp joint was present



## DIAGNOSIS

Diagnosis is primarily based on clinical examination and imaging studies:

- X-rays AP/Lat: Show subchondral sclerosis, flattening of the metatarsal head, and joint space narrowing in 2nd MTP
- MRI also confirmed the Diagnosis

## TREATMENT OPTIONS

### Nonoperative Management:

- Activity modification: Reducing weight-bearing activities to prevent further stress on the affected bone.
- NSAIDs: Used to manage pain and inflammation.
- Immobilization: A short-leg walking cast or boot may be used for 4–6 weeks in severe cases.
- Orthotics: Stiff-soled shoes with metatarsal bars or pads can help redistribute pressure.

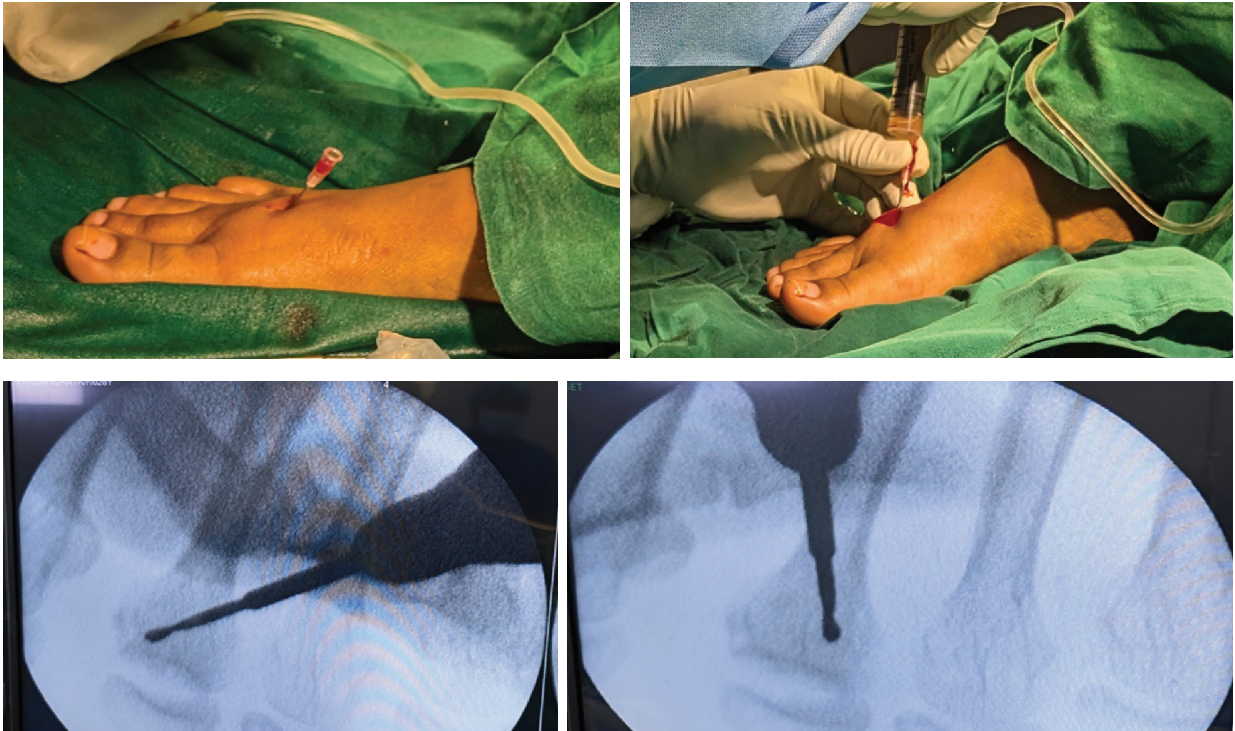
### Surgical Interventions:

Surgery is considered in patients who do not respond to conservative treatment or present with advanced disease. Metatarsophalangeal Arthrotomy - Removal of loose bodies from the joint. Dorsal Closing-Wedge Osteotomy - Used when dorsal involvement of bone and cartilage is significant. Du Vries Arthroplasty - Partial resection of the metatarsal head, indicated in severe cases (Stage 4 or 5).

We did a modified approach entry

A novel and minimally invasive approach for the treatment of Freiberg's disease was performed under local anesthesia with image guidance. Using an 18-gauge needle entry,

A 2mm burr was used into the second metatarsal head for core decompression. Platelet-rich plasma (PRP) was injected into the metatarsal head (1.5ml) and joint (0.5ml) to promote healing. A compression bandage was applied, and the patient followed a structured weight-bearing protocol. By six weeks, the patient was pain-free with an improved range of motion, demonstrating the effectiveness of this innovative technique in managing Freiberg's disease with minimal surgical intervention.



## CONCLUSION

Freiberg's disease is a rare but significant condition affecting the foot, primarily seen in adolescent females.

Early diagnosis through imaging and clinical assessment is crucial for effective management.

While conservative treatments are preferred in the early stages, surgical intervention may be required in advanced stages by minimally invasive technique with platelet rich plasma. Proper treatment can help prevent long-term complications and maintain foot function.



## ROTATOR CUFF EXERCISES

### Shoulder Anatomy:

The shoulder is one of the most intricate structures in the human body. The following structures are involved in the movement of the shoulder joint.

#### \* **Bones:**

The humerus, clavicle, scapula, sternum and ribcage.

#### \* **Joints:**

Sternoclavicular, acromioclavicular, glenohumeral and scapulothoracic joint.

#### \* **Muscles:**

Supraspinatus, infraspinatus, teres minor, subscapularis, collectively known as the rotator cuff muscles, plus scapular stabilizing and GH joint muscles.

#### \* **Ligaments:**

Capsular, coronoid, coracoacromial, superior transverse and trapezoid ligaments.

#### \* **Bursae:**

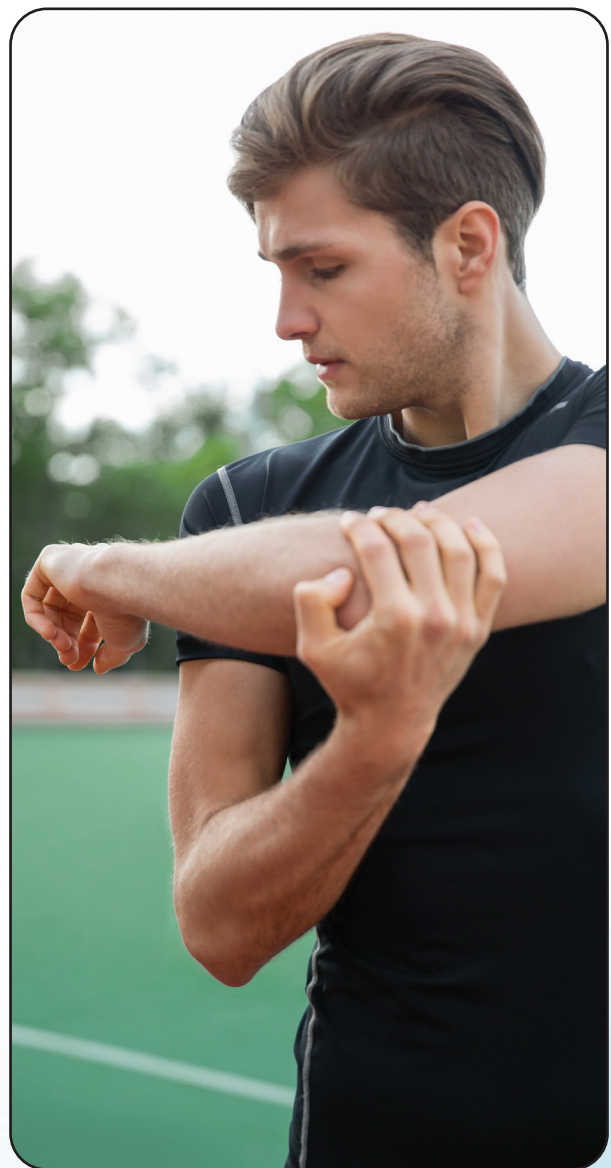
Subdeltoid, subacromial, subscapular and subcoracoid bursae.

#### \* **Nerves**

Brachial plexus, subscapular nerve, axillary nerve, suprascapular nerve.

#### \* **Blood Vessels:**

Anterior and posterior circumflex arteries.



# ROTATOR CUFF EXERCISES

## Injury Mechanisms of the Rotator Cuff:

In general, rotator cuff injuries are caused by an underlying impingement progression (or) an instability progression.

- Primary compressive disease (Primary shoulder impingement)
- Secondary compressive disease (Secondary shoulder impingement)
- Primary tensile overload.
- Secondary tensile disease.
- Macrotrauma failure.
- Acromial shape and form:

**Type III acromial shape is strongly associated with rotator cuff injuries.**

- Hypo vascularity of the rotator cuff.
- Weakened dynamic stabilizers.
- Acromioclavicular joint degeneration
- Increasing age,
- Arm position.
- Decreased endurance capacity of the scapular stabilizers
- Capsular tightness.
- Position of the humerus at rest
- Scapular asymmetry.
- Repetitive arm motion.
- Postural imbalance.

## Rotator Cuff Injuries:

- Shoulder impingement syndrome
  - \* Stage I
  - \* Stage II
  - \* Stage III
- Rotator cuff Tendinitis.
- Rotator cuff tears
  - \* Partial thickness (or) incomplete tears.
  - \* Full - thickness tears.

## Diagnosing Rotator cuff Injuries

- \* Patient history
- \* Physical examinations
- \* Palpation





# ROTATOR CUFF EXERCISES

- \* Range of motion (or) Rom testing.
- \* Special tests (by health care provider) (eg) - Supraspinatus test.
  - Infraspinatus test.
  - Sub Scapularis test.
  - Impingement tests
- \* Neer Impingement sign
- \* Hawkins Kennedy test

## Imaging Techniques:

- Plain Radiographs (X-Rays)
- Conservative Arthrography
- Magnetic Resonance Imaging
- Ultrasonography.
- Electro diagnostic test.

## Treatment and Management of Rotator Cuff Injuries:

- Protection and Rest:-
- Minimizing shoulder and arm movements till pain sets in.
- Ice / Cold and Heat Applications

Application of cold and hot compression are important during the first 24 to 72 hours after injury.

Patients that are performing a post injury fitness program for a rotator cuff injury will still need to continue icing in order to keep inflammation down in the shoulder joint the will need heat to promote circulation to the rotator cuff

## Massage (provided by qualified professional)

## Activity modifications

## Exercise.

### Type of Exercises:-

- Range of motion exercises
- Strengthening exercises.
- Stretching (or) flexibility exercises.
- Warm up and cool down exercises.

## ROTATOR CUFF EXERCISES

### ROM exercises:-

- Pendulum exercises
- Pulley exercises.
- WAND exercises
- Wall shoulder stretch
- Isometric exercises.
- **Strengthening exercises - Body weight.**
- Four point Arm to side leading with thumb.
- Four point with 1/2 Y
- Four point with 1/2 W.

### Tubing exercises.

#### Tubing Row

#### Low tubing "T" row

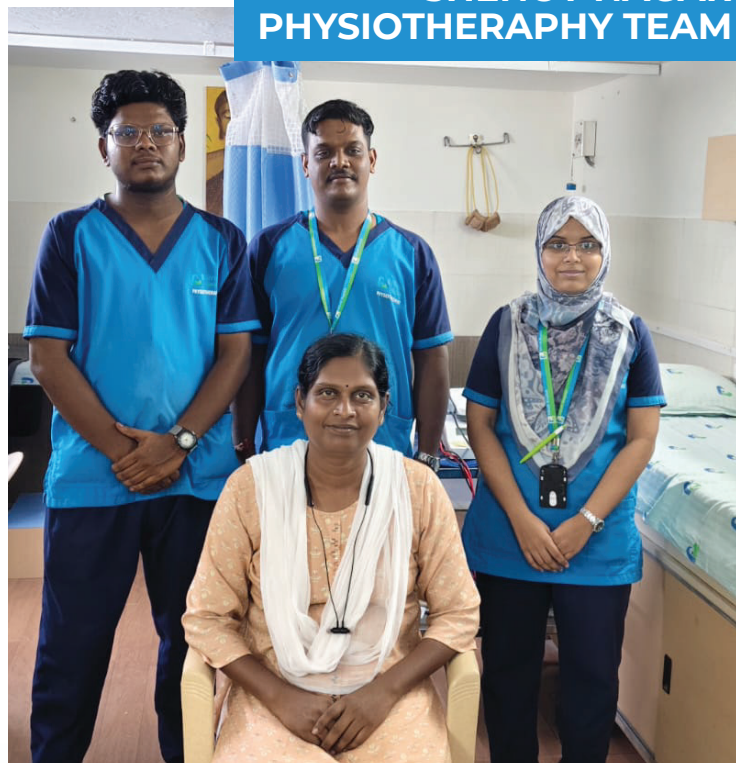
#### High tubing "T" row

#### Swim ball exercises

#### Dumbell exercises

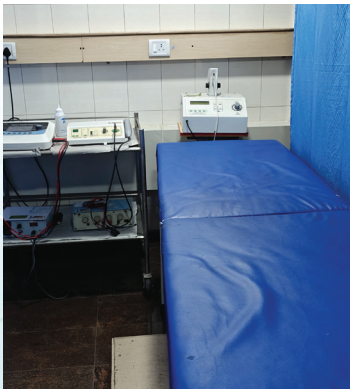
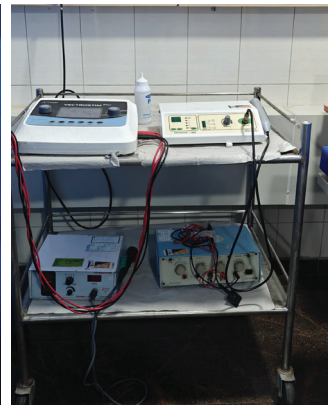
#### Pulley strengthening exercises.

### SHENOY NAGAR PHYSIOTHERAPY TEAM





## R A PURAM PHYSIOTHERAPY TEAM



## CME ON GLYCEMIC CONTROL

We successfully conducted a CME program on "**Glycemic Control: Leveraging New Generation Basal and Bolus Insulin Therapies**" on February 25, 2025. The session was led by Dr. Sathyanarayana Sa, Senior Consultant Diabetologist, who provided valuable insights into optimizing inpatient diabetes management with advanced insulin therapies. The interactive session was well-received, enhancing knowledge and clinical practices for better patient outcomes.

### CME on **Adapting Advanced Technology for Diabetes Management – CGM with Connected Care System.**

We successfully conducted a CME program on "Adapting Advanced Technology for Diabetes Management – CGM with Connected Care System" by Dr. Satyanarayana Sa on March 20, 2025, was a great success! The session provided valuable insights into Continuous Glucose Monitoring (CGM) and its role in optimizing diabetes care. Engaging discussions enriched our understanding of advanced diabetes management. A heartfelt thank you to all attendees for your active participation!





## BILLROTH HOSPITALS PARTNERS WITH WORKING WOMEN ASSOCIATION FOR WORLD WOMEN'S DAY EMPOWERMENT CAMP

Billroth Hospitals conducted a comprehensive health check-up camp on World Women's Day, March 8, 2025, in collaboration with the "Working Women Association of Chennai." The event, held at Santhome Church, provided 200 women with essential health services and skill-building workshops, empowering them to thrive both personally and professionally. This initiative emphasized the importance of supporting and uplifting women in the workforce, fostering community collaboration for meaningful change.



## CELEBRATING WOMEN'S HEALTH ON INTERNATIONAL WOMEN'S DAY!

In celebration of International Women's Day, a Medical Health Camp was organized on March 8, 2025, for the Women's Association of Madras Veterinary College. This initiative aimed to raise awareness about women's health, promote early detection of medical conditions, and encourage overall well-being.

The event saw an enthusiastic turnout, with many women taking advantage of one-on-one medical consultations, lifestyle guidance, and preventive care strategies. Expert healthcare professionals provided personalized advice on maintaining a healthy lifestyle, addressing common health concerns, and the importance of regular health check-ups.

Participants expressed their heartfelt appreciation, emphasizing how such initiatives make healthcare more accessible and encourage a proactive approach to well-being. Many shared how this session gave them valuable insights into preventive care and early diagnosis, reinforcing the need for consistent health monitoring.

Events like these highlight the importance of community-driven healthcare initiatives that empower women to take charge of their health.





## BILLROTH HOSPITAL'S BLOOD DONATION CAMP AT VASHI INDUSTRIES

Billroth Hospitals successfully organized a Blood Donation Camp at Vashi Industries, Thiruverkadu, on 22nd March 2025. The initiative aimed to raise awareness about the importance of blood donation and contribute to saving lives. We thanks to the generous donors who stepped forward to make a difference.

We extend our heartfelt gratitude to all the donors and Vashi Industries for their support in this noble cause. Together, we continue to make a positive impact on community health!



## LEARN CPR - TRAINING EVENT AT SHENOY NAGAR SKATING PARK & ANNA NAGAR TOWER PARK.

Billroth Hospitals successfully conducted the Learn CPR - training event at Shenoy Nagar Skating Park & Anna Nagar Tower Park on March 1, 2025. Gracing the occasion as our esteemed **Chief Guest Mr. Ilavarasu**, whose presence added significance to the training session. Under expert guidance, attendees engaged in hands-on CPR practice, learning the crucial steps to take during medical emergencies. The event provided valuable insights into performing chest compressions, rescue breathing, and recognizing signs of cardiac arrest.

This initiative emphasized the importance of CPR training in empowering individuals to act swiftly in critical situations, potentially saving lives within their communities. The overwhelming response and active participation showcased the collective commitment to fostering a safer environment for all.

A heartfelt thank you to everyone who joined us in this meaningful endeavor! Together, we are building a community of rescue heroes, ready to make a difference when it matters most.









## BILLROTH HOSPITAL ORGANIZES BLOOD DONATION CAMP AT PADAPPAI

Billroth Hospitals successfully conducted a Blood Donation Camp on March 15, 2025, at Seventh Day Adventist Church, Padappai. The event witnessed enthusiastic participation, with a total of 40 donors stepping forward to contribute to this noble cause. Their generous donations will help save numerous lives, reinforcing the spirit of community service and healthcare awareness.

We extend our heartfelt gratitude to all the donors and organizers for making this initiative a success!







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