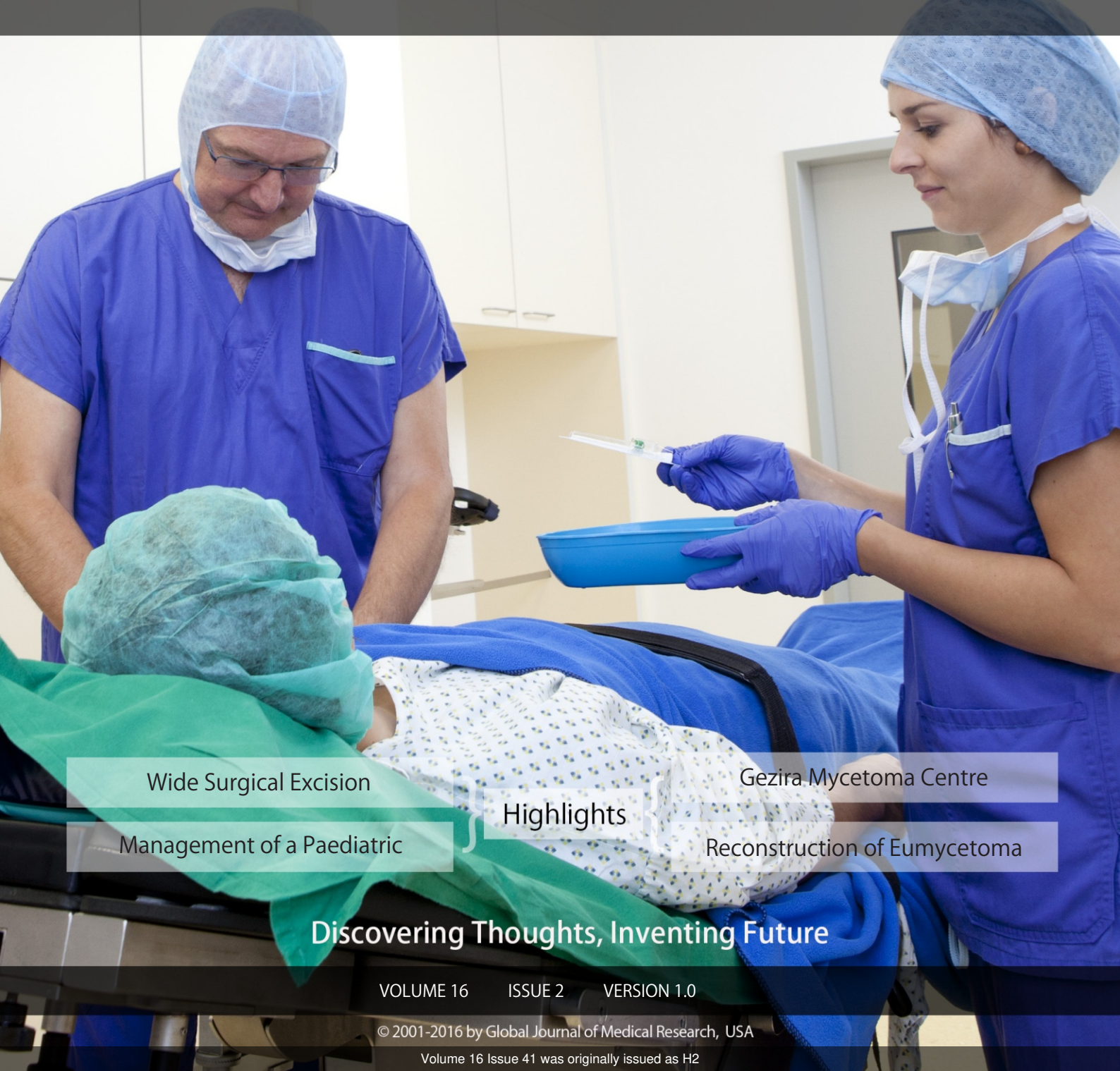
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Management of a Paediatric

Highlights

Gezira Mycetoma Centre

Reconstruction of Eumycetoma

Discovering Thoughts, Inventing Future

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Management of a Paediatric Femoral Neck Fracture with Infection and Early Loss of Fixation with Closed Reduction with Cancellous Screws and Fibular Grafting: A Rare Case Report and Review of Literature

By Dr. Mihir Desai & Dr. Shivanand Bandekar

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Abstract- Fractures of neck in paediatric population is a rare variety. It comprises less than 1% of all paediatric fractures. Fractures of neck occur in paediatric population as a result of high energy trauma or in a weakend bone due to pre-existing pathologic process in the proximal femur. Early Anatomical reduction and internal fixation in Delbet Type 2 fractures is recommended in literature to avoid complications in a growing child like avascular necrosis, coxavara, non-union and chondrlysis. Infection in a hip fracture in a child is a very rare complication accounting for only 1% of complication rate according to James McCarthy and Kenneth Noonan et al. Infecton can also lead to loss of reduction and subsequent collapse as in this case.

Keywords: failed paediatric femoral neck fracture fixation, infection, collapse, revision, non-vascularised fibular graft, union.

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Management of a Paediatric Femoral Neck Fracture with Infection and Early Loss of Fixation with Closed Reduction with Cancellous Screws and Fibular Grafting: A Rare Case Report and Review of Literature

Dr. Mihir Desai [α] & Dr. Shivanand Bandekar [σ]

Abstract- Fractures of neck in paediatric population is a rare variety. It comprises less than 1% of all paediatric fractures. Fractures of neck occur in paediatric population as a result of high energy trauma or in a weakend bone due to pre-existing pathologic process in the proximal femur. Early Anatomical reduction and internal fixation in Delbet Type 2 fractures is recommended in literature to avoid complications in a growing child like avascular necrosis, coxavara, non-union and chondrlysis. Infection in a hip fracture in a child is a very rare complication accounting for only 1% of complication rate according to James McCarthy and Kenneth Noonan et al. Infecton can also lead to loss of reduction and subsequent collapse as in this case. There are various treatment options available for non-union fracture neck in children which includes use of vascularized or non-vascularised fibular bone graft combined with or without a subtrochanteric valgus osteotomy, use of muscle-pedicle bone graft or in some cases use of iliac crest grafts.

We present a case of type 2 Delbet femoral transcervical fracture in a 12 year old girl child treated within 24 hours with Closed Reduction and Internal Fixation with cannulated 6.5mm cancellous screws and washers. Patient developed a delayed infection after 2 weeks with subsequent loss of reduction and collapse at fracture site. This was again revised with closed reduction and internal fixation with 6.5mm cancellous screws along with non-vascularised fibular grafting which went to unite well in an acceptable varus position and excellent functional outcome.

Keywords: failed paediatric femoral neck fracture fixation, infection, collapse, revision, non-vascularised fibular graft, union.

I. Introduction

Fractures of the neck of femur are rare injuries in children accounting for less than 1% of total paediatric trauma. Most of them are due to high-energy trauma. If the fracture has occurred due to a trivial trauma, it might be due to a pre-existing pathology which has weakened the proximal femoral bone.[1,2,16]. The blood supply to the head of femur is precarious and varies according to the age of the patient. Majority of the blood supply comes from medial circumflex branches of lateral epiphyseal arteries and in this patient according to her age, some part of blood supply will also come through ligamentum teres.[8,16]. It forms a very important factor for development of non-union and avascular necrosis of head of femur.[5,6]. Delay in reduction and inappropriate Fixation Technique to get an anatomical reduction results in known complications like Avascular necrosis, Coxa-Vara, non-union.[3,4]

This patient was operated within 24 hours of presentation with closed reduction and internal fixation. Stable reduction was achieved. Delay in diagnosis or delayed in anatomical fixation has been the consistent factor for development of Avascular necrosis an non-union.[5,8]. Anatomical reduction is the key to prevent nonunion and resultant deformities. Closed reduction is the preffered treatment of choice but the surgeon should not hesitate for doing an open reduction for non-reducible fractures.[12]

Inspite of early reduction and internal fixation, unfortunately the patient developed delayed infection and loss of reduction within the first 3 weeks. Infection after fixation is not a common complication in paediatric hips.[16]. There are various techniques described in literature for treating infection and failure of fixation. These include revision surgery with complete debridement of infected tissues, use of a non-vascularised or vascularized fibular grafts, use of Meyer's muscle-pedicle bone-grafting. These procedures can be combined with subtrochanteric valgus osteotomy if the patient has a residual varus deformity along with non-union.[9,14]

We used a non-vascularised fibular graft along with two 6.5mm cancellous screw[9,11]. Patient was kept nonweight bearing and a de-rotation boot for 8 weeks. Fracture went to unite well in about 3 months with excellent range of motions and an acceptable varusdeformity. According to Ratliff's criteria, the patient had good functional outcome.[2,7]. There was complete range of motions possible including squatting and sitting cross-legged.(fig 8,9,10).

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Figures 8,9,10: The child able to squat and sit cross legged.

Case report-We present a case of 12 year old girl with self-fall at school with Delbet type 2 transcervical fracture of left femoral neck(fig1). Patient was taken up for surgery within 48 hours of injury at our institute.



Figure 1: Pre-operative x-ray showing Type 2 Delbet femoral neck fracture.

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Primary surgery was done with Closed Reduction and Internal Fixation. Reduction was achieved under Fluoroscopic guidance and then fixed with with 2 Titanium Cannulated Cancellous 6.5mm screws over guidewires. A lateral approach was taken. And the screws were inserted with a small incision just below the greater trochanter using a cannulated cancellous system. (fig 2)



Figure 2: Postoperative x-ray after primary surgery on day 2.

This patient had an uneventful hospital stay and was later on discharged and followed up after 10 days. Within first 3 weeks of primary surgery, patient had developed serosanguineous discharge. Total count was normal. But laboratory markers of infection like ESR and C-Reactive Protein were elevated. X-Ray taken at this stage revealed loss of reduction and collapse at fracture site (fig3).



Figure 3: Xray taken at 3 weeks postoperative period after primary surgery showing loss of reduction and collapse.

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Patient was re-admitted and started on intravenous antibiotics. A swab from the discharge was sent before starting antibiotics. But the report of the swab culture and sensitivity was non-significant. Therefore Empirical therapy in the form of 3rd generation cephalosporins were continued for 3 weeks. At the end of this period, discharge was completely stopped.

Laboratory Blood markers of infection in the form of Total count, ESR (Erythrocyte Sedimentation Rate) and C-Reactive Protein were negative. Patient was planned for repeat Surgery with implant removal and use of a Fibular graft. Patients relatives were explained the prognosis and a formal Bone graft consent was taken from parents.

Intra-operative findings-Lateral Approach and Same incision as primary surgery was used. Previous implants were removed. Adequate wash was given. All the fibrous tissue in the Sub-muscular plane was debrided. Fortunately for the patient, A repeat closed reduction at the fracture site was achieved under Fluoroscopic guidance and the capsule was not incised. This prevented further microvascular injury of head of the femur by preventing the cutting of the anterior capsule.

Guidewires were then inserted as planned.1st guidewire was inserted in the inferior quadrant in the Antero-posterior plane and posterior in the Lateral view under Fluoroscopic guidance. 2nd guidewire was inserted in the Central quadrant in both Anterior and Lateral views. 3rd guidewire was inserted in the Superior quadrant in the Antero-posterior view and in the Anterior plane in the Lateral view. All the 3 guidewires were inserted upto the physis taking care not to penetrate the physis. Using a similar length guidewire and under fluoroscopic guidance, accuarate length of the screws were taken which were to be inserted. A non-vascularised fibular graft was taken from the ipsilateral leg. The length of the graft was according to the 3rd guidewire placed in the Supero-Anterior quadrant. (fig4)

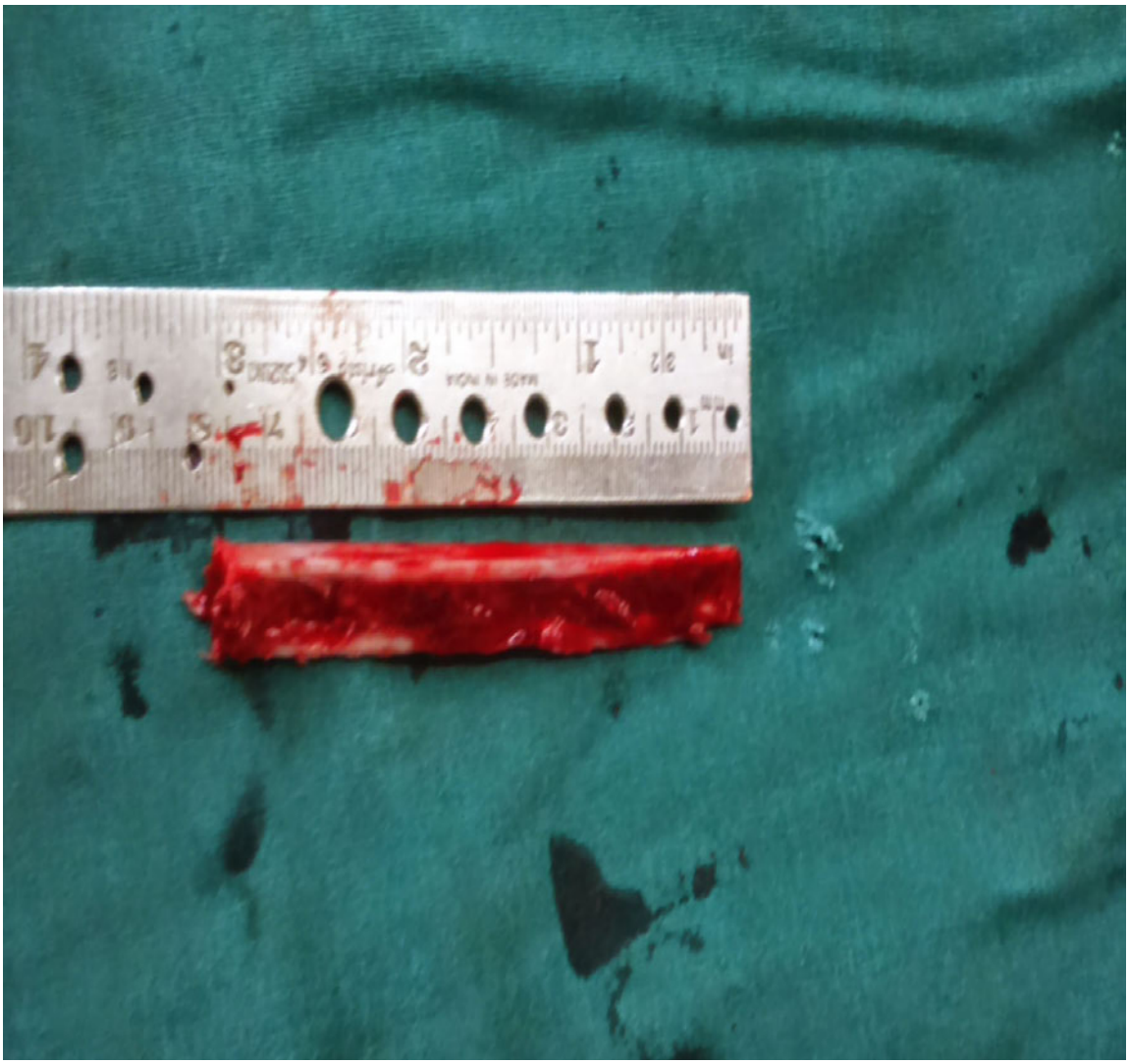


Figure 4: The appropriate length of non-vascularised fibular graft being measured according to the length of the guide-wire.

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The medullary canal of the graft was reamed with a 3.5mm drill-bit before insertion.

As per the measured sizes of the screw, cannulated 6.5mm screws were inserted over the guidewires. At the same time, reduction was being checked continuously under fluoroscopy. As per the literature, central compression screw was first tightened. Then, the infero-posterior screw was inserted and tightened. Both the screws were inserted well below the physis. Then the well-prepared fibular graft was inserted in the Supero-anterior Quadrant. This position of the graft acted as a de-rotation screw as well as provided a graft for the non-union part.

The reduction and the position of the screws as well as the graft was confirmed again before closure. No drains were kept. A sterile dressing was put and patient was given a Long-Knee Brace and a De-Rotation Boot. Immediate post-operative period was uneventful in the hospital. Intravenous antibiotics in the form of 3rd generation cephalosporins were administered for 72 hours. Patient was put on oral Cefuroxime and discharged on the 7th post-operative day after confirming healthy wound status.

II. Post-Operative Period

Long knee brace and a de-rotation boot for a period of 8 weeks. Isometric Quadriceps and hamstring exercises were started immediately. However, patient was kept complete Non-Weight bearing for 8 weeks. Stitches were removed at 2 weeks. Knee mobilization and CPM exercises were started after 4 weeks. Serial Radiographs were taken every 3 weeks. There were signs of union after 8-10 weeks of follow-up period. After 10 weeks patient was started on Partial-Weight bearing. By this time, she had got good range of motion at hip and knee.

Complete union was visible on x-rays in both Antero-Posterior and Lateral views after about 14 weeks postoperative period (fig 5, 6).



Figure 5: Postoperative antero-posterior x-ray taken at 14 weeks showing signs of union.



Figure 6: Postoperative lateral view at 14 weeks showing good alignment and signs of union.

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Patient was made to fully weight bear by then. There was residual varus angulation after union. But that was an acceptable degrees of Varus considering the age of the patient and the fact that it was a second surgery after infection. Butclinically, patient had no residual deformities. She was able to walk without an Abductor lurch. Squatting and Sitting cross-leg was also possible. (fig 8,9,10). Patient is still under follow-up since 15 months and has no clinical syptoms. (figure7)



Figure 7: Postoperative x-ray at 15 months followup.

Since, clinically patient had excellent range of movements and good union and considering the age of patient, decision to perform a Valgus osteotomy to correct residual varus was deferred. (video1)



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Video 1: Patient followup at 15 months showing gait pattern and excellent range of movements.

III. Discussion

Fractures neck of femur in paediatric age group are rare but serious injuries. Majority of them are high-energy traumas. If there is no history of significant trauma, then a thorough search should be made to rule out pathological causes that can weaken the proximal femoral architecture.[1,16] like a bony cyst or osteomyelitis. Delbet classification is a helpful classification for providing a diagnostic as well as prognostic classification.

Delbet classification of hip fractures in children.

1. Transepiphyseal with (IB) or without (IA) dislocation from the acetabulum;
2. Transcervical;
3. Cervicotrochanteric;
4. and Intertrochanteric.[16]

Prognosis wise type 1 and type 2 fractures have a poorer prognosis for the development of osteonecrosis, non-union and consequent varus collapse and deformities. Precarious blood supply around the head of femur makes it highly vulnerable for these complications. Before the age of 8 years, vessels through ligamentum teres provide very little blood supply. Majority of the blood supply is by medial circumflex branches of Lateral Epiphyseal vessels.[5,6]. Inadequate reduction or loss of fixation like in this case leads to complications like non-union, osteonecrosis with or without resultant varusdeformity. Most of these complications are due to capsular tear and resultant injury to the capsular and retinacular vessels and over-enthusiastic manipulation techniques during fixation.[3,8] Therefore Early and accurate reduction within 48 hours is recommended.[2,3].

Osteonecrosis is the most dreaded complication of delbet type2 fractures. The reported incidence in literature varies from 17-47%. Although the contributing factors remain inconclusive, contributing factors include type and degree of displacement in

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fractures, age of the child, timing of surgery and type of fixation.[1,2,5], According to Lam and Ratliff, major complication is developmental coxa vara.[2] leading to poor functional outcomes. In modern orthopaedic practice, conservative treatment in the form of hip spics is hardly practiced for the treatment of paediatric neck fractures. It carries a high risk of loss of reduction and resulatantvarus deformity.[3]. Incidence was higher in type 2 fractures according to the study by Moon and Melhman.[5]. Infection is a rare complication and the reported rate of infection is 1% in postoperative cases in femur neck fractures.[2] Unfortunately, our case fell in that 1% and got a delayed infection in 3weeks postoperative period.

In our case, there was an early loss of reduction due to infection. We revised the fixation using a non-vascularised fibular graft and internal fixation using 6.5mm cancellous screws. The results of a non-vascularised fibular graft are widely studied in literature. It provides a strong bony support at the fracture site. It also acts as a graft material and starts the process of osteoconduction and acts as a bed for neo-vascularisation. According to recent series, reported success of using a fibular grafting is as high as 70% in adult patients.[9,11]. Nagi, et al reported union rates of as high as 90% with this technique.[11]. According to reports, free fibular grafting provides good union rates and prevents osteonecrosis and improves functional recovery.[10], A vascularized fibular graft provides better success rates and is superior to free fibular graft but it is still highly technically demanding procedure and is limited by other limiting factors like microsurgical instruments and economy of time.[11,15]. Major studies are done with the use of fibular graft for non-union neck of femur in adult age group. But the results for use in paediatric population are also equally encouraging. [11,13,15]. Fibular grafting acts as a structural support and "biological implant" which later on incorporates well with the head of femur.[11,13]

In our case, the graft incorporated well in 12-14 weeks. There was no collapse or no fracture of the fibular graft.

Major cause of non-union in children is presumed to be due to thick functional periosteum and in-adequate reduction in a severely displaced type2 fracture.[2]. This leads to Coxa-Vara which is the most disabling complication and it also leads to early closure of physis. Both these complications lead to shortening and a gait with an Abductor Lurch. Shortening appears to be independent of fracture type or osteonecrosis in some studies.[1]. According a long-term study published by Nagi et al, Functional outcome was studied according to the following criteria,[15]

Table I: Criteria for grading the results

Clinical features						Radiological features	
Grade (degrees)	Pain	Shortening (cm)	Hip ROM*	Walking ability	AVN	Nonunion	CoxaVara
Excellent	None	<1	Full	Full	No	None	None
Good	None	1 to 2	Rotation/flexion restricted by 15°	Full	No or healed	None	<10
Fair	Intermittent	2 to 3	Rotation <50% Flexion 90° only	1 km without aids	AVN No segmental collapse	None	11 to 20
Poor	Constant	>3	Marked restriction	None without aids	AVN with collapse	Present	>20

**ROM- range of movement*

IV. Avn-Avascular Necrosis

According to this criteria, our case has good functional outcome with only limiting factor was resulatant varus deformity which was less than 10 degrees. But the patient had no shortening or no defective gait. According to Ratliff's criteria also, our case had Good outcome.[2]

In Postoperative period, patient was kept non-weight bearing but was mobilized on crutches. Early static quadriceps and hamstring exercises are very important to initiate to prevent quadriceps atrophy .Adequate time of 8-12 weeks have to be given for incorporation of fibular graft.[1,10]. Anderson et al reported minor complications at the fibular graft donor site like mild tenderness and occasional ankle swelling which presumably occurred due to the loss of origin of long muscles.[11]

V. Conclusion

Paediatric neck fractures are rare injuries and associated with disabling complications. Early Fixation is recommended within first 48 hours. Even if it is treated early, there are rare chances like in this case which can have complications like Infection and Early loss of Reduction. Non-Vascularised Fibular grafting along with cancellous screw fixation provides a technically less demanding option and is a very reliable procedure with encouraging union-rate and functionaly recovery.

Conflicts of interest-None

Written Informed consent of the patient-Taken

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Replace the Patella in Total Knee Arthroplasty or Not. Always, Never or Selectively: What to Do?

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Abstract- Wether to resurface or not the patella during total knee arthroplasty (TKA) remains controversial. Actually there is three options: always, never or selective resurface. Surgeons in favour of resurface say that non-resurfaced patients have more anterior knee pain and worst knee function scores. In the other side surgeons that leave patella un-resurfaced advocate that it avoids complications with similar postoperative results. This review will discuss the recent available literature on patellar resurfacing based on randomized controlled trials and published meta-analyses. Most of the meta-analysis seems to favour routinely resurfacing of the patella based on less reoperations. However, the most recent RCT show no difference between both options. So far, a method for accurately predicting which patients can avoid patellar resurfacing has not been found.

Keywords: *patellar resurfacing, TKA, total knee arthroplasty.*

GJMR-H Classification: *NLMC Code: WE 312*



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Replace the Patella in Total Knee Arthroplasty or Not. Always, Never or Selectively: What to Do?

Dr. Rafael Calvo [α], Dr. Daniel Paccot [σ], Dr. David Figueroa [ρ] & Dr. Sergio Arellano [ω]

Abstract- Wether to resurface or not the patella during total knee arthroplasty (TKA) remains controversial. Actually there is three options: always, never or selective resurface. Surgeons in favour of resurface say that non-resurfaced patients have more anterior knee pain and worst knee function scores. In the other side surgeons that leave patella un-resurfaced advocate that it avoids complications with similar postoperative results. This review will discuss the recent available literature on patellar resurfacing based on randomized controlled trials and published meta-analyses. Most of the meta-analysis seems to favour routinely resurfacing of the patella based on less re-operations. However, the most recent RCT show no difference between both options. So far, a method for accurately predicting which patients can avoid patellar resurfacing has not been found.

Keywords: patellar resurfacing, TKA, total knee arthroplasty.

I. Introduction

Symptomatic knee arthrosis is a very common disease with a prevalence of 3.8% of our population in 2010 and is increasing due to an aging population (1). The total knee arthroplasty (TKA) has improved the quality of life of millions of patients suffering from severe osteoarthritis in the last decade, and has become one of the most satisfactory procedures for both the patient and the surgeon (2). Some studies have shown that TKA is one of the most common procedures in hospitals actually (3,4). Despite this, some technical details of the surgical technique like patellar replacement remain the subject of debate today. Initially TKA designs didn't include a patellar component and was associated with high rates of anterior knee pain 40-50% (5,6). In 1976, Insall showed that in 4 different prosthetic designs, the most important problems were the post-operative anterior knee pain and encouraged the incorporation of patellar replacement in the TKA. A variety of complications have been attributed to resurfacing of the patella with an incidence of 4-50% including avascular necrosis, patellar fracture, patella tendon injury, patellar clunk, aseptic loosening, and polyethylene wear of the patella component (7). These complications have been associated to difficult revision procedure (8), leading to avoid routinely resurfacing the patella in TKA. Classically Burnett et al described indications of patellar replacement trying to get an answer for this dilemma(9). However, actually there is three options during surgery: always replace the patella, never replace it and perform a selective patellar replacement. Surgeons who always realize patellar resurfacing advocate that this procedure can reduce the incidence of anterior knee pain despite the complications. In the other side surgeons that never replace the patella advocate that the procedure is faster, cheaper and with no functional differences. Finally, the third group of surgeons decides during surgery whether or not to replace the patella under the conditions of articular cartilage, bone stock of the patella, patellar type and some individual characteristics such as weight and height (10).

The aim of this study is to summarize the recent evidence-based literature that is available to date and discuss the outcomes whether to perform or not routinely patellar replacement in TKA. The focus of this evidence-based analysis will be on the outcomes of anterior knee pain, reoperation, and patient satisfaction after total knee arthroplasty with and without patellar resurfacing

II. Methods

A literature review was performed in electronic databases PubMed, Medline and Embase, crossing the words "patellar resurfacing" and "Total knee arthroplasty". We excluded manuscripts that were not in English. All level I evidence studies published from January 2012 to October 2015 were included.

We found 139 that reached our inclusion criteria. Two independent authors assessed these studies with title, selecting finally 16 title. In the event of any inconsistency between the authors we included the paper to read its abstract. Sixteen summaries were evaluated, 8 of them were removed: 4 of them for being literature reviews and 4 for being retrospective studies. Finally, we find 8 level I evidence: Five meta-analysis of randomized prospective studies and three randomized prospective studies. Fig 1.

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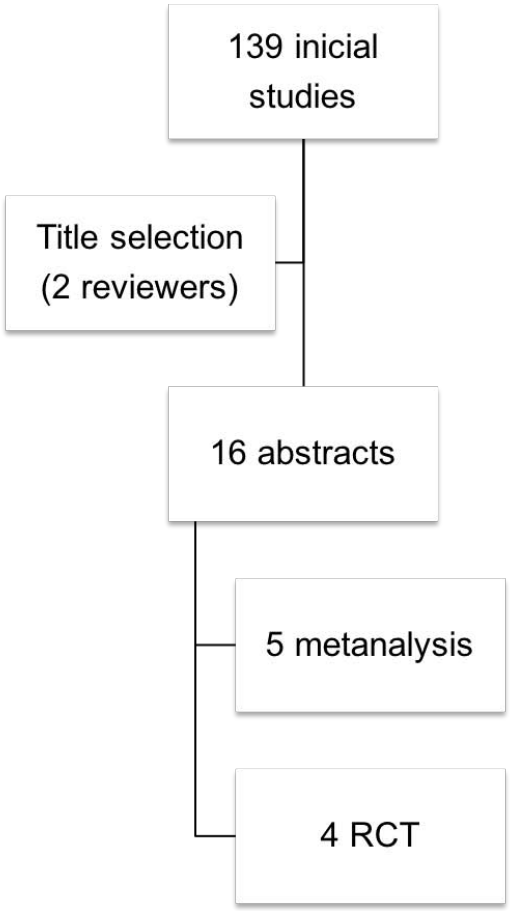


Fig Nº1: Flowchart of studies selection

III. Results

Five meta-analysis of randomized controlled trials and three recent controlled trials were found. Among the meta-analysis, five of them were of the year 2011. The first one seeks to compare the functional outcomes and postoperative complications of patients undergoing TKA with or without patellar replacement (11). This meta-analysis conducted between 1966 and 2009 included 16 randomized studies with a total of 3034 patients. As conclusion, they found that reoperations in patients without patellar replacement were significantly greater (p: 0.03), however, there was no difference in anterior knee pain and functional scales. The second meta-analysis evaluated 10 randomized controlled trials between 1966 and 2010 with a total of 1003 patients (12). This study concluded that the rate of reoperations decreased significantly by 4% (p: 0.06) and that by replacing the patella in 25 patients, a re-intervention was prevented. However, just as the previous study they found no significant difference in anterior knee pain. Finally, Pavlou et al (13), realized a meta-analysis of which included 18 randomized controlled trials with a total of 7075 patients. This study, unlike the two above, included the study by Tabutin et al from 2005 (14), which incorporated 5915 patients with TKA. This study concluded that the rate of reoperations in patients with patellar replacement was lower (p: 0.012) and that the rate of anterior knee pain and functional scales was similar in both groups. Due to the incorporation of Tabutin study the results of this meta-analysis are very similar to the one of this study.

In 2012, Pilling et al (15) performed a new meta-analysis including studies up to 2011 with a total of 16 randomized controlled trials and 3465 patients. This study concluded that the KSS(Knee Society Score) was higher in patients with patellar replacement (p: 0.005) and that there was a tendency to have a higher incidence of anterior knee pain in patients without patellar replacement (24% vs 13%); However, this difference was not statistically significant (p: 0.1). The rate of complications was higher in patients without patellar replacement (p: 0.02) as well as re-interventions due to anterior knee pain (p: 0.00001) and patellofemoral complications (p: 0.002). Finally, no differences were found in the infection rate, operative time and radiographic appearance.

The last meta-analysis found in the recent literature is the one of Chen et al in 2013 (16), which included randomized studies between 1966 and 2012. This study included 14 studies with a total of 1725 patients, finding similar results to the previous studies

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previously mentioned with respect to reoperations, complications and knee pain. One of the knew findings of this study was that in patients with more than 5 years of follow-up, KSS was higher in patients with patellar replacement (p: 0,002)

Several of these meta-analyses indicate as a conclusion that more prospective randomized controlled trials (RCT) should be performed to evaluate the utility of patellar resurfacing. In our research we find three recent RCT.

The first study is from Breeman et al (17), which began in 1999 and included a total of 1715 randomized TKA with and without patellar replacement. In their results, they did not find significant differences in knee function scales, reoperation rates and costs at 5 years of follow up.

In 2012 Beaupre et al (18) performed a prospective study with 5 and 10 years of follow-up assessing pain, function and reoperations including 38 patients. Functional scales and pain were increasing over the years in both groups with no difference between them at 5 and 10 years. There was no difference in reoperations rates between the two groups. The most recent prospective randomized study is that of Roberts et al in 2015 (19) who realized a prospective randomized study evaluating 350 knees excluding patella with bone exposure, beginning the study in 1996. This study demonstrated that patient satisfaction was greater for patients with patellar replacement, however, it was balanced when follow-up was greater than 10 years. On the other hand, when analysing functional scores, complications and prosthetic survival, no significant difference was found.

Author	Year	Number of patients	Conclusions
He et al	2011	3034	Resurfacing reduces the risk of reoperations after TKR. No difference in terms of anterior knee pain, KSS and knee function score.
Fu et al	2011	1003	Resurfacing reduces the risk of reoperations after TKR. No difference in anterior knee pain
Pavlou et al	2011	7075	Resurfacing reduce the risk of reoperations after TKR. No difference in anterior knee pain and knee function score.
Pilling et al	2012	3465	Resurfacing reduce patelofemoral complication and reoperation rate due to anterior knee pain. No diference in KSS score or knee function score.
Chen et al	2013	1725	Resurfacing reduces the risk of reoperations after TKR. No difference in terms of anterior knee pain, KSS and knee function score.

Figure N°2: Meta-analysis of randomized controlled trials of patellar resurfacing *vs* non resurfacing in primary TKA. KSS: Knee society score.

Author	Year	Number of patients	Follow up	Conclusions
Breeman et al	2011	175	5 years	No diference regarding functional outcome, reoperation rate and total health care cost at 5 years post TKR.
Baeupre et al	2012	38	10 years	No differences in knee function score at 5 and 10 years of follow up.
Roberts et al	2015	327	7.8 years	No difference in knee function score and complications. In follow up < 10 years: resurfacing with better satisfaction Infollow up < 10 years: No difference

Figure N°3: Randomized controlled trials of patellar resurfacing *vs* non resurfacing in primary TKA.

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IV. Discussion

In our research we found five meta-analyses and three RCT on whether or not replace the patella in TKS. In the five meta-analyses with evidence 1a, the conclusion was that there is a higher rate of reoperations in the patient group without patellar replacement; however, there are no differences in functional scales, patient satisfaction and anterior knee pain. In the other hand, when assessing the most recent RCT, there are no differences in functional scales, anterior knee pain, reoperations and costs.

Regarding meta-analyses, it is important to note that most studies are based on a similar database since they often include the same prospective randomized studies that have existed in the literature since 1966, all of which are methodologically similar. In second place we should mention that most patients come from older studies with different components and patellar replacement techniques. Currently there are different patellar replacement options that did not exist at the time of the first prospective studies and therefore we don't know if these new techniques decrease the incidence of anterior knee pain and knee function scores. Finally, the TKA has become a more common surgery nowadays and therefore improving surgical skills and achieving better results so we need more prospective RCT in the future to evaluate the actual TKA design.

In the other side we found three RCT with a well designed study that did not found statistical difference in both groups. Despite the fact that RCT are the best studies to evaluate an intervention, they have some limitations because this studies have few patients to make a statistical difference and it's difficult to isolate confounding variables. In order to eliminate this confounding variables, Burnett et al realized a RCT with 32 patients with bilateral knee arthorplasty, performing one knee with patellar resurfacing and the other one without. At 10 years of follow up, there was no difference with regard to range of motion, knee society score, satisfaction, revision rates, or anterior knee pain. Moreover, they found that 37% of patients preferred the resurfaced knee and 22% the non-resurfaced knee (20).

As mentioned above, one of the difference found in the meta-analyses (but not in RCT) is that resurface the patella in primary TKA decrease the reoperation rate. There is multiple etiologies of re-interventions, however, the most common cause is anterior knee pain. Burnett et al indicate in their study that there are several options for the management of patellofemoral pain, however in patients who have not undergone patellar replacement, the surgeon recommends an initial patellar replacement assuming that the pain originates in the patella (21). On the other hand, in patients with primary patellar replacement with anterior pain, an initial non-surgical management is generally performed. This would explain the higher rate of re-operations in patients without patellar replacement in the primary TKA (22). It should be noted that there are studies that demonstrate that patellar replacement in a second intervention does not manage pain completely, leading to worst knee functional score (23).

In patients without patellar replacement, there is some options to avoid anterior knee pain. One option is to realize a patelloplasty which include the excision and reshaping of the patella to better match de femoral component. Liu et al realized a randomized study of 133 patients between reshaping group and resurfacing group. They concluded that there was no difference between the groups with regard to the KSS, anterior knee pain rate and radiograph at a minimum of 7 years of follow up (24). Another option to decrease anterior knee pain is to realize a denervation to destroy nociception fibers in non-resurfaced patella. Li et al realized a meta-analysis of RCT of 657 knees comparing non resurfaced patella with and without denervation. They demonstrated that there was no difference in anterior knee pain and visual analogue score. However, they find knee function score and WOMAC score was significantly higher in the denervation group concluding that denervation might lead to less anterior knee pain and better TKA function. In our review we didn't find studies comparing resurfacing with denervation.

The third option during TKA is the selection of patients for patellar resurfacing. Bourne et al recommend not resurfacing in patients younger than 60 years, with well articulate patella and mild arthrosis (25). Barrack et al realized a RCT to evaluate factors that influence the results of TKR with or without patellar resurfacing. In this study; obesity, the degree of patellar chondromalacia, and the presence of preoperative anterior knee pain didn't predict postoperative clinical scores or the presence of postoperative anterior knee pain. They concluded that post anterior knee pain couldn't be predicted with any clinical or radiological parameter studied (26). Peng et al in their study also don´t recommend that weight or pre operative knee score be used to decide to resurface the patella or not (27). In the other side there is other studies that have show that weight is a predictive factor of anterior knee pain and recommend resurfacing in patients with BMI of more tan 30 mg/m2 or more tan 60 kg (28-29). The degree of chondromalacia found intra-operatively has also been used to decide patellar resurfacing. Some recent studies have show that there is no correlation between patellar chondral injury and anterior knee pain or re-operation rate (21-26). Actually there is no predictor to tell when to resurface the patella; however, we believe, like Antholz, that we should take into account the knee pain, the patient weight, the grade of condromalacia and the knee alignment (30).

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V. Conclusion

The current evidence regarding the TKA outcomes with or without patellar resurfacing is not conclusive. Based on the meta-analysis found in this review, surgeon may decide to routinely resurface the patella. However, the most recent RCT haven't got the same results. With this study we can say that in the current literature there is no agreement regarding if patella have to be or not resurfaced in primary TKA. Currently in the United States, more than 90% of PTRs have patellar replacement, while in Europe there is still no clear prevalence of surgical technique. Future research should focus on developing criteria for selecting those patients that would benefit from TKA without patellar resurfacing, and thus decreasing surgical complications.

So far the search for the "perfect" patellar component has not been achieved, leaving us a long way to go in the future of TKR. We must therefore continue working to identify the most appropriate patient for patellar replacement or to look for new alternatives that can settle this issue definitively and put an end to 40 years of controversy.

Our behaviour

Our behaviour is selective replacement, we believe that the management of the patella in TKA should be determined from case to case according to pre-operative parameters as BMI, age, anterior knee pain, knee alignment and intraoperative parameters as articular cartilage conditions. Actually in our practice and due to our patient's type, patellar replacement is realized in 90% of cases.

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Wide Surgical Excision and Reconstruction of Eumycetoma in Gezira Mycetoma Centre

By Mohamed D. A. Gismalla, Gamal M. Abdulla, Mogahid M. Ali & Sami M. Mohamed

University of Gezira

Abstract- Introduction: Surgical excision and antifungal chemotherapy are definitive treatment of eumycetoma. To show wide surgical excision plus reconstruction as a surgical modality for big size eumycetoma.

Methods: This is prospective, centred based study. Patients who underwent wide surgical excision and reconstructions after surgery were selected. We checked different variables age, sex, site of eumycetoma, the size of eumycetoma lesion, history of recurrence and types of reconstruction done.

Results: Wide surgical excision was done for 24 patients. Patients characteristics revealed male: female ratio is 5:1. History of recurrence occurred in 11 patients. Diagnosis of eumycetoma confirmed cytologically. Bone x-ray revealed no involvements. Eumycetoma was found in a variable site. In this study site of eumycetoma were Knee 6 patients, foot 6 patients, leg 4 patients, hand 4, gluteal 3 and hand in 1 patient. The size of eumycetoma lesions were variables from 8 to 20 cm diameters. All patients receive antifungal therapy. Types of reconstruction done for those patients varied from local to advance flaps and or skin grafts.

Keywords: mycetoma, wide surgical excision, reconstruction, skin graft, flap.

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Conclusions: Reconstruction after wide excision gives good outcome in big size eumycetoma lesions with combination therapy of medical treatments.

Keywords: mycetoma, wide surgical excision, reconstruction, skin graft, flap.

I. Introduction

Treatment of eumycetoma does not follow global or regional guidelines on the last years. It depends on personal clinical experiences and studies. There are some centers offered massive surgical excision and amputation for eumycetoma without giving medical treatments (1,2). There is no consensus on treatment regimens that are used to eumycetoma to get cures and prevent relapse(3).

Treatments of eumycetoma are major challenge, because it is relatively not responded to medical treatments only. Recently, in tropical and subtropical countries, e.g. in Sudan, eumycetoma are treated by a combination of antifungal (azole) chemotherapy together with surgical excisions. Frequently itraconazole is used as antifungal treatments for months, and sometimes over years (1,4,5).

We conduct this study to shows eumycetoma patients underwent Wide Surgical Excisions (WSE) and plastic reconstruction. In this study WSE plus local or transfer flaps and/or skin graft was done for big size eumycetoma lesions. This surgical modality with chemotherapeutic antifungal give good outcome.

II. Subjects and Methods

This is prospective, descriptive, centre based study. Patients who underwent operation in Gezira mycetoma centre were studied. In this study, we include patient with eumycetoma, underwent wide surgical excision and reconstruction after excision, and in regular fellow up till 9 -12 months. We exclude any patient with eumycetoma underwent excision and primary closure or amputation or there are bone involvements in x-ray's.

We checked different variables age, sex, site of eumycetoma, size of eumycetoma lesion, history of recurrence and types of reconstruction done. Diagnose of eumycetoma depends on residency in endemic area, discharge black grain, past history of operation, and clinical examination, cytological diagnosis and x-rays was done. All patients received antifungal therapy before and or after surgery.

III. Results

In this study, we found 24 patients that fulfil our criteria. Patients characteristics revealed 20 males in comparison to 4 females. Age distributed as (≤ 19 years) 7 patients, (20-39 years) 11patients, (≥ 40 years) 6 patients. Eleven patients had history of recurrent mycetoma and previews surgical operation. Diagnosis of eumycetoma confirmed cytologically. Bone x-ray revealed no involvements.

Eumycetoma were found in a variable site in this study. The site of eumycetoma was found Knee 6 patients, foot 6 patients, leg 4 patients, hand 4, gluteal 3 and hand 1in patient. Size of eumycetoma lesions was variables from 8 to 20 cm diameters. The smaller size found in hand and feet. Types of reconstruction done for those patients shown in **Table1**. After wide excision and reconstruction, we can close skin easily **Fig1-3.** Hospital stayed was reduced. We followed the patients for 9-12 months. Patient had good healing. There is one case of recurrence.

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IV. Discussion

The aim of surgical treatment is complete removal of the lesions (6). Surgical operations to eumycetoma range from wide surgical excision, debulking excision or amputations (5,8). Surgical excisions are preferred for localized small lesions when patient present early without disrepute the capsule and this will lead to good outcome (1,5-8).

Others surgical indications are resistance to medical treatment or for better response to medical treatment in patients with massive disease (1,5,8). Amputation is indicated in advanced mycetoma not responding to medical treatment with severe secondary bacterial infection, and it can be a life-saving procedure (1,5,9,10).

In this study, we perform wide surgical excision for eumycetoma for big size lesions (8 cm or more) Fig 1-3. This excision is done with margins to eradicate the disease (0.5-2 2) cm margins. These operations done for patients without bone involvements. There is technical difficulty to do primary closer after wide excision. So, we decide to select reconstruction to close the skin defect. This reconstruction is varied from skin graft to local or advanced flaps.

After 9-12 months' fellow, up of those patients it showed good healing and started to go back their ordinary activity. There is one case of recurrence after 6 months. In our study, we did operations for big lesions with history of recurrences and discharging sinus. Also for patients who had slow respond to medical treatments.

Foot is the common site of mycetoma (70 – 80%) the foot, followed by the hands (12%), legs, and knee joints[11,12]. In this study mycetoma occurs at different parts knee 6 patients, foot 6 patients, leg 4 patients, hand 4, gluteal 3 and hand mycetoma in one patient.

We can conclude that, Wide surgical excision and reconstruction for eumycetoma can be done for big size lesions or difficult to close skin primary with good outcome

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Tables

Table 1: Types of reconstruction after excision

Types OF reconstruction	Frequency
Skin graft	12
V-Y advancement	5
Gastrocnemius Flap	4
Dorsalis pedis pedicled flap	1
Lateral calcaneal artery skin flap	2
Total	24

Figures



Fig. 1: A: Knee Mycetoma

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Fig. 1: B: Knee after excision and Gastrocnemius flap



Fig. 1: C: Knee after reconstruction and skin graft



Fig. 2: A: Recurrent Knee Mycetoma with sinuses



Fig. 2: B: Knee after wide excision



Fig. 2: C: Knee after skin graft



Fig. 3: A: Foot mycetoma with sinuses



Fig. 3 : B: Foot after wide excision



Fig. 3: C: Foot after skin graft

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Subtalar Dislocation Case Report and Literature Review

By Tomas Perez Cervera

Introduction- Subtalar dislocation is a simultaneous dislocation of the talo – calcanea and talo – navicular joints without any tibio – talar or talar neck assocaiated fractures. They are very rare injuries, for what few cases are described in the literature.(1) They predominate in young patients about third decade of the life, with a major incident in males that in women (6:1).(2) Usually these are opened injuries, being associated with high energy trauma. The mechanism of injury occurrs in relation with rainfalls, traffic accidents or in the sports practice.(3) They can happen in any direction, producing an important deformity of the ankle. In occasions they can produce fractures on the talus, the ankle or in the fifth metatarsal.(4)

Four types of subtalar dislocation are described:

a) Medial (80 – 85%) → the foot and calcaneus is displaced medially, the head of talus is prominent dorsolaterally and the navicular is situated medially and sometimes dorsal to the talar head. The medial dislocation has been referred to as an "acquired clubfoot,"
b) Lateral (15 – 20%) → the lateral is described in the older literature as an "acquired flatfoot." (2)
c) Posterior and anterior formas are rare (1 – 2.5%)

GJMR-H Classification: NLMC Code: WE 168



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c) Posterior and anterior formas are rare (1 – 2.5%)

Closed reduction of the dislocation must be performed as soon as posible to avoid further damage to the skin and neurovascular problems. If this is not possible, open reduction is recommended. [4]

This lesion was first described in 1811 by Judey and Dufarest, but it was not until 1853 when Broca made the first classification. In 1856, Malgaigne and Buerguer changed the classification of Broca, presenting the classification that is currently used. [5] As discussed above, this is a very rare injury that accounts for 1-2 % of all dislocations and 15 % of lesions of the talus.

II. Case Report

We report the case of a patient of 52 years old with no medical history of interest who comes to the emergency department after falling from a ladder in which it was uploaded (approximately 1.5 m).

The patient complained of severe pain in his right ankle. On examination the foot was appreciated inflamed, deformed and displaced medially. A bony prominence on the anterolateral edge of the foot represented the head of the talus. The skin was tension on the talar region without solution of continuity exist on it. There was no distal neurovascular compromise. At first it was diagnosed in the emergency department as a sprained ankle, which attempted to reduce there but without success.

After AP and lateral radiographs of the foot and ankle were taken, subtalar dislocation was diagnosed. The displacement of the calcaneus and the rest of the foot in relation to the talus was observed. The calcaneus was dislocated medially in the AP and remained neutral on the side. (Figure 1,2,3)

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Figure 1



Figure 2

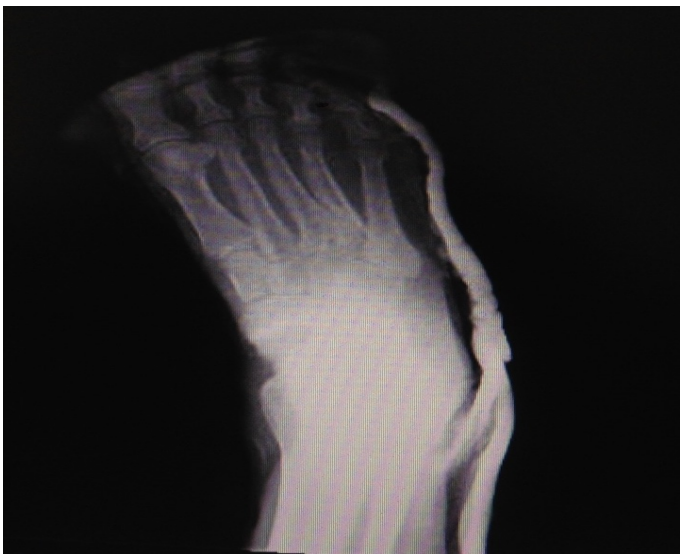


Figure 3

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After this, the patient was taken to the operating room where under spinal anesthesia and fluoroscopy control proceeded to carry out the maneuvers described for closed reduction of the dislocation. Flexion of the knee was conducted at 90º, drive shaft keeping the foot plantar flexed and then abduction and eversion of the foot with progressive dorsiflexion. Successful repositioning of the joint, we proceeded to stabilize the subtalar joint and talo - navicular with 2 percutaneous Kirschner wires and immobilize the leg with a posterior splint. After the reduction, we checked the presence of pedal pulse and posterior tibial, and requested a CT scan which confirmed the anatomical reduction and the presence of small fractures or bone avulsion at the level of the calcaneus and cuboid bone. (Figures 4,5)



Figure 4



Figure 5

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The patient started a mobilization protocol at 4 weeks, the wires were dropped at 6 weeks and began traveling charge until the tenth week, when he was allowed full charge. At 6 months after the injury the patient has a range of motion similar to the opposite foot subtalar joint.

III. Discussion

From the first classification by Broca, to the expanded classification by Malgaigne and Buerger, an anatomical approach has been used to described this condition. Four types of subtalar dislocations based on the position of the foot relative to the talus have been recognized.[5] The medial dislocation is the most common, and accounts for 80–85 % of all cases. Lateral dislocation represents 15– 20 % of dislocations. The posterior and anterior forms are rare and account for 2.5 % and <1 % of dislocations, respectively.[6] The low incidence represented by the anterior and posterior forms, for some authors, is explained because they cause high instability and can easily become medial and lateral dislocations respectively.[7,8] In the medial dislocation, the foot is initially plantar flexed and inverted, then an external rotation of the talus occurs. The rupture of the dorsal talo - navicular ligament occurs first, then the interosseous ligament tears from anterior to posterior, and the anterior talocalcaneal joint and the posterior talocalcaneal joint are dislocated. The lateral dislocation begins with the foot in eversion. First a deltoid ligament rupture occurs, then a disruption of the interosseous ligament and the talo - calcaneal joint followed by dorsal talo - navicular ligament failure. [9] These lesions should be suspected in patients presenting to the emergency services after sustaining a high energy trauma, injury from sport activities, or twisting forces in the foot. [10] Clinically, there is gross deformity with or without involvement of surrounding soft tissues, which depends on the amount of energy involved and on the elapsed time from the injury. This gross swelling may mask bony deformity. In medial subtalar dislocations, the foot and calcaneous are displaced medially and the talar head is prominent dorsolaterally. Also, the foot is in plantar flexion and supinated. On the other hand, in lateral dislocations the calcaneous is displaced lateral to the talus as well as the navicular, and the talar head lies medially with the foot pronated. Although biomechanical studies have shown a similar pattern of ligamentous injury within lateral and medial dislocations, lateral dislocations more often show soft tissue and bone injury, and a higher need for open reduction. [11,12]

Regarding the request complementary tests, we begin with some plain radiographs that include the AP and lateral projections and the mortise. After the reduction, it may be advisable to request a CT scan to confirm proper articular congruity and rule out associated injuries that may be present between 38.8 and 88 % of cases. [10,12,13] In our case specifically, there were small bone fragments associated with avulsion level calcaneus and cuboid.

Closed reduction of these dislocations should be performed as early as possible to avoid further damage to the skin and neurovascular structures. If this is not possible, then open reduction without further delay is recommended. The closed reduction maneuvers are to be performed, in a first, a knee flexion to relax the gastrocnemius accompanied by a constant drive shaft member in the same direction as the deformity. Then a force is exerted in the opposite direction until dislocation of the talar head is contained in the concavity of the scaphoid. [8, 14]

Once closed reduction is performed, the neurovascular status as well as foot stability should be assessed through prono - supination manoeuvres. Irreducible injuries have been reported in 0 to 47 % of cases. [11,13,15] The most common cause in any type of dislocation is the interposition of bone fragments from associated fractures, which has been described in up to 50 % of cases. In medial dislocations, the most common causes are either entrapment of the talar head within the extensor retinaculum or between the extensor tendons, but also other structures such as the deep peroneal neurovascular bundle can be involved. In contrast, either the posterior tibialis tendon or the flexor halluces longus are the typical anatomical structures interposed in the outer aspect of the talar neck in lateral dislocations. [16,17]

Immobilization can be done with a splint or bivalve posterior plaster, to avoid excessive compression which may favor the presence of a compartmental síndorme. Some authors advocate a period of immobilization of 4-6 weeks may be slightly higher if you have associated injuries. In cases of dislocations submit postreduction instability, they can be used AK or external fixators. When there is no associated instability may start early mobilization around 3 weeks after immobilization. [18,19]

The results of uncomplicated dislocations are reported to be good with some limitation of subtalar joint motion. The poor results were associated with open or lateral dislocations, infection, associated fractures, high energy injuries and failure to diagnose the dislocation promptly. Osteonecrosis has been reported very rarely after this injury.

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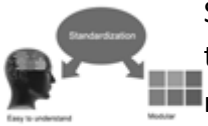


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3. Submission of Manuscripts,

4. Manuscript's Category,

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5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

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9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

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12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

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21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.



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27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

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Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
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In every sections of your document

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· Keep on paying attention on the research topic of the paper

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· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

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· Shun use of extra pictures - include only those figures essential to presenting results

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The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

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- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

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- Center on shortening results - bound background information to a verdict or two, if completely necessary
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- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

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Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
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What to keep away from

- Resources and methods are not a set of information.
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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

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- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
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- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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