ORIGINAL RESEARCH PAPER
VOLUME-6 | ISSUE-5 | MAY - 2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

Management of Patella Fractures with Tension Band Wiring

Orthopaedic

Dr. I C Chenchaiah Associate Professor, Department of Orthopaedics Alluri Sitarama Raju Academy of Medical Sciences Eluru – 534 005, West Godavari District Andhra Pradesh

Dr. U Pavan Krishna Postgraduate, Department of Orthopaedics Alluri Sitarama Raju Academy of Medical Sciences Eluru – 534 005, West Godavari District Andhra Pradesh

Dr N.Partha Sarathy Professor & HOD, Department of Community Medicine, Alluri Sitarama Raju Academy of Medical Sciences Eluru – 534 005, West Godavari District Andhra Pradesh

Dr A Sravani Postgraduate, Department of Community Medicine, Alluri Sitarama Raju Academy of Medical Sciences Eluru – 534 005, West Godavari District Andhra Pradesh

ABSTRACT

Background: Patella is the largest sesamoid bone in the body situated in the quadriceps tendon. Patella plays a vital role in extensor mechanism of the knee.It has a higher prevalence in the age group of 20y to 50y and a slight male predominance. Tension-band wiring is commonly used to treat transverse patella fractures. In this study a series of 30 cases of fracture patella have been analysed after treating with Tension Band Wiring. Outcome was assessed using west's criteria.

Aim & Objectives: To Study the clinical outcome of fracture patella treated with tension band wiring.

Materials and Methods: This is a prospective study of patients who attended the orthopaedicout patient department in AlluriSitaramaraju Institute of Medical Sciences between September 2014 to february 2016. 30 adult patients with patella fractures and who satisfy the inclusion criteria were selected for treatment and assessment.

Results: This study is conducted to analyse clinical outcome of fracture patella treated with tension band wiring.In our series out of 30 cases of fracture patella treated with tension band wiring ,26 patients had excellent oucome at their final follow up.Good results are seen in 3 patients and poor outcome in 1 patient.4 out of 30 patients had complications like infection ,k-wire migration, loss of flexion of 25 degrees

KEYWORDS:

Patella, Tension Band Wiring

INTRODUCTION

Patella is the largest sesamoid bone in the body situated in the quadriceps tendon.patella plays a vital role in extensor mechanism of the knee. Developmentally largest animals like elephant does not have a patella, thereby indicating the patella is unique for bipedal posture.It functions as a linkage between quadrecips tendon and patella ligament,by providing a mechanical advantage of first order of lever by virtue of its proximity to insertion in to the tibialtubercleIt has a higher prevalence in the age group of 20y to 50y and a slight male predominance. Transverse fractures for which tension band wiring is the gold standard generally occurs in older individuals through a low energy trauma,however they do not necessarily present the best outcome. comminuted fractures are often caused by high energy trauma in young individuals ,being preferably treated with partial or total patellectomy and do not result in poor functional outcome.

AIM OF THE STUDY

To Study the clinical outcome of fracture patella treated with tension band wiring.

OBJECTIVES

The objectives of the study are to study:

1. The advantages of tension band wiring fixation in patella fracture.
2. The complications associated with this method of fixation.
3. To assess the role of early mobilization with this technique.
4. To compare the results of our study with that of other similar studies.

MATERIALS AND METHODS

This is a prospective study of patients who attended the orthopaedic out patient department in AlluriSitaramaraju Institute of Medical Sciences between September 2014 to february 2016. 30 adult patients with patella fractures and who satisfy the inclusion criteria were selected for treatment would inevitabl`y lead to a disability by causing loss of earning capacity.

Tension-band wiring is commonly used to treat transverse patella fractures. The most common configuration has parallel Kirschner (K) wires and a stainless steel wire loop placed in a vertically oriented figure of eight. Among the selected 30 patients 24 were males and 6 were females.

In this study a series of 30 cases of fracture patella have been analysed after treating with Tension Band Wiring. Outcome was assessed using west's criteria.

17 patients were operated for patella fractures of the right knee and 13 patients were operated on the left side. During the study period we did not lose any patient to follow up and results of all the 30 patients were assessed and analyzed.

Inclusion criteria:

1. Patients of age above 18 years of age
2. Transverse fracture with displacement of more than 2 to 3 mm and articular step of more than 2mm.Minimally comminuted fractures.
3. patients with closed and type I open transverse patellar fractures .

Exclusion criteria:

1. Type III compound fractures.
2. Grossly comminuted, vertical or marginal fractures.
3. Old fractures (more than 3-6 weeks).
4. Pathological fractures

All patients on admission were clinically assessed and stabilisedhemodynamically. Radiographs of knee joint in two planes ap& lateral views are taken.Aspiration of the knee joint is done in cases of haemarthrosis.patient is stabilesed in a above knee

slab.ethicalcommitteclearence was taken for all patients. patients are operated at an average interval of 2 days from date of admission They were all operated in supine position using standard longitudinal midline inscision. The patients were stabilized with an above knee slab and pressure bandage in the operation theatre itself after closure and dressings. Routine antibiotics and anti-inflammatory drugs were given. Postoperatively patient was kept in ward for 10 to12 days. Check x-ray was taken on 2nd day after drain removal. Sterile dressings were done on 2nd, 5th and 8th post-operative day.From 3rd post operative day i.v antibiotics are stopped & patient is advised to do straight leg raising (SLR), quadriceps strengthening exercise, weight bearing as tolerated.

Sutures were removed from 10th to 12th day; later on knee flexion was started with quadriceps board and with continuous passive motion (CPM) machine.

The patients were questioned about subjective complaints like pain, difficulty in walking, squatting, climbing and getting down stairs and ability to perform routine work.

***Operative treatment*:**
There are **three types** of operative treatment of patellar fractures.
They are

1. Restoration of normal anatomy of fractured fragments by using metallic implants. The goal is restoration of articular congruity and repair of the extensor mechanism with fixation secure enough to allow early motion.

2. Repair of quadriceps apparatus retaining only the large fragment. ***Partial patellectomy***.

3. Repair of quadriceps apparatus after excising patella. ***Total patellectomy***.

TENSION BAND WIRING SURGICAL TECHNIQUE:
Technique:
Patellar fracture approached in the usual fashion. Carefully clean the fracture surfaces of blood clot and small fragments. Explore the extent of the retinacular tears and inspect the trochlear groove of the femur for any articular damage. Thoroughly lavage the joint. If the major proximal and distal fragments are large, reduce them accurately, with special attention to restoring a smooth articular surface. With the fracture reduced and held firmly with clamps, drill two 2-mm Kirschner wires from inferior to superior through each fragment. Place these wires about 5 mm deep to the anterior surface of the patella along lines dividing the patella into medial, central, and lateral thirds. Insert the wires as parallel as possible. In some cases, it is easier to insert the wires through the fracture site into the proximal fragment in a retrograde manner before reduction.

This is made easier by tilting the fracture anteriorly about 90 degrees. Then withdraw the wires until they are flush with the fracture site, accurately reduce the fracture and hold it with clamps, and drive the wires through the distal fragment.

Leave the ends of the wires long, protruding beyond the patella and quadriceps tendon attachments to the inferior and superior fragments. Now pass a strand of 18-gauge stainless steel wire transversely through the quadriceps tendon attachment, as close to the bone as possible, deep to the protruding Kirschner wires, then over the anterior surface of the reduced patella, then transversely through the patellar tendon attachment on the inferior fragment and deep to the protruding Kirschner wires, then back over the anterior patellar surface; tighten it at the upper end. Alternatively, place the wire in a figure-eight fashion. Check the reduction by palpating the undersurface of the patella with the knee extended. If necessary, make a small longitudinal incision in the retinaculum to allow insertion of the finger. Bend the upper ends of the two Kirschner wires acutely anteriorly and cut them short. Once they are cut, rotate the Kirschner wires 180 degrees and, with an impactor, embed the bent ends into the superior margin of the patella posterior to the wire loops. Cut theprotruding ends of the Kirschner wires short inferiorly. Repair the retinacular tears with multiple interrupted sutures.

DISCUSSION

Patella plays a vital role in the extensor mechanism of knee.it functions as a linkage providing continuity from the quadriceps tendon to the patellar ligament.It protects large exposed femoral condyles and along with quadrecips and hamstrings act as a brake and helps in sudden stoppage of movement while running & climbing up and down over flight of steps.

Patellar fractures are common and it constitutes about 1% of all skeletal injuries resulting from either direct or indirect trauma. The subcutaneous location of the patella makes it vulnerable to direct trauma as in dashboard injuries or a fall on the flexed knee. Whereas violent contraction of the quadriceps results in indirect fractures of patella.

In the present series 22 fractures (73%) were as a result of indirect mechanism as in forceful flexion of the knee against the contracted quadriceps, and 8 cases (27%) were due to direct trauma (RTA) to the patella.

In the present siries, immobilisation was given for about 10 days. At the end of 8 weeks excellent. We had four cases with complications, among which one case had wound gaping for which secondary suturing was done, another with superficial skin infection which was controlled by 3rd week post operatively. The 3rd case had terminal 250 of flexion restriction. And in the fourth case here was migration of the pin through the skin, for which implant removal was done and the limb was immobilized in a cylindrical cast for 4 weeks.

CONCLUSION

Patella fractures occur due to Indirect & direct mechanism, fractures resulting from indirect injury tend to be less comminuted than those from direct trauma, but they are displaced and are often transverse. Out of various treatment modalities available for treatment of patella fractures tesnsion band wiring seemed to be a effective method in treating closed & type 1 open transverse fracture.

This study is conducted to analyse clinical outcome of fracture patella treated with tension band wiring.In our series out of 30 cases of fracture patella treated with tension band wiring ,26 patients had excellent oucome at their final follow up.Good results are seen in 3 patients and poor outcome in 1 patient.4 out of 30 patients had complications like infection ,k-wire migration, loss of flexion of 25 degrees.we conclude that anatomical reduction and stable fixation in patellar fracture is necessary for the normal integrity and stability of the joint&tension band wiring is a definitive procedure in management of displaced transverse patellar fracture with least complications.

REFERENCES

1. Malgaingne JF. "Fractures in Adults". Rockwood Greens New York. LIPPINCOTT WILLIAMS & WILKINS. V Edition. 2001.
2. THOMPSON JEM, comminuted fractures of the Patella JBJS (Am) 1935:17:431-436.
3. BROOKER.R. "Treatment of fracture patella by excision" a study of morphology of function Br. J.surg 1936-37: 24:733.
4. GROOVES.E.W HEY "A note on the extension apparatus of the knee joint" 1937: Br.J.Surg 24:747-748.
5. HAXTON.H.A. "The functions of the patella and the effects of its excision" SurgGynaeObstet 1945: 80:389.
6. SCOTT.J.C: "fractures of the patella" JBJS: 1949: 31-Br: 76.
7. E1NOLAS.S, A.J.AHO and P.KALLIO. "Patellectomy after fracture" Acta. orthoScand 1967:441-447.
8. MULLER-M.E. et al. "Manual of internal fixation" Technique recommended by the AO-ASIF group 564-568.
9. KAUFER.H. "Mechanical functions of the patella" JBJS (Am) 1971:53:1551.
10. WEBER.K.J., JANECKI CJ. Me LEOD P. et al. "Efficacy of various forms of fixation of transverse fractures of the patella". JBJS A 1980:62(2) March.
11. DUDANI. B and SANCHET1 K.M "Management of fracture patellae by tension band wiring" Ind.Jortho 1981:15-1:43-48.
12. LIANG, QUAN and WU.JIA WEN "Fracture of the patella treated by open reduction and external compressive skeletal fixation" JBJS (Am) 1987:69-A: 83-89.

13. MARYA S.K, BHAN S and DAVE P.K "Comparative study of knee function after patellectomy and osteosynthesis with a tension band wiring following the patellar fracture" Int.Surg 1987:72(4) Oct-Dec.
14. WALTER BRAUN MANFRED, AXEL, KLAUS KUNDEL and STEPHEN "Indications and results of non-operative treatment of patellar fractures" Clinical ortho and related research 1993:289,197-201.
15. A.K.Us and KINIK "Self-locking modified tension band technique" Arch Orthop Trauma Surg 1999:119:432-434.