

Bilateral Uncemented Hemiarthroplasty in a Patient with Bilateral Lower limb PPRP with Right Knee Arthrodesis: Surgical Difficulties and Techniques

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Abstract

Introduction: Standard references such as knee and lower leg position cannot be used in patients with knee arthrodesis with a bilateral neck of femur fracture during bipolar hemiarthroplasty. We describe a simple technique that guides a surgeon in assessing the femoral stem version in such cases.

Case report: We present a case of 52 years old male with bilateral lower limb Post Polio Residual Paralysis with right knee arthrodesis who sustained bilateral neck of femur fractures. The difficulties, in this case, were the inability to flex the knee and to use the ankle or the opposite limb and its bony landmarks as reference.

Conclusion: We describe a simple surgical technique of inserting a Steinmann pin in the distal femur in the coronal plane parallel to the transcondylar axis for intraoperative assessment of neutral position and version of the femoral stem.

Keywords: Bilateral; hemiarthroplasty; femoral stem; anteversion; knee arthrodesis.

Introduction

The standard techniques for intraoperative assessment of version of the stem by measuring the angle between the lower-leg axis and trial stem axis by flexing the knee and placing the tibia vertically are not useful in attempting hip arthroplasty in a patient with ipsilateral knee arthrodesis (flexural limitations of the knee) [1]. The ankle can also be not used as a guide in these cases, as the rotation of leg with respect to the femur could have been altered during the knee arthrodesis. Surgical difficulties in such cases can culminate in component malposition. Component malposition is known to cause dislocation [2], decreased range of movement [3], bony impingement [4] and component wear [5]. Hence getting a correct femoral stem version is of utmost importance while performing a hemiarthroplasty and we describe a simple technique that guides a surgeon in assessing the version of femoral stem in such difficult cases.

Case Report

We present a case of 52 years old male with bilateral lower limb Post Polio Residual Paralysis (PPRP) with right knee arthrodesis done 15 years ago who presented with complaints of bilateral hip pain and inability to walk following trauma due to fall. The patient had a history of deformity around the knee (most likely flexion deformity) for which he was operated with knee arthrodesis to provide a stable function limb 15 years back (detailed documents were not available). The patient had been walking full weight-bearing with minimal support (using a stick)

before trauma due to fall.

On examination: the patient had hypoplastic bilateral lower limb (right > left) that were externally rotated and shortened (patient was walking with a shoe raise on the right side before the trauma). There was a healed surgical scar of about 10 cm on the anterior aspect of the right knee. The right knee was locked in extension. The tone of the muscles was normal. There was no distal neurovascular deficit. A radiograph of the pelvis showed a right-sided sub-capital and a left-sided basicervical type of femur neck fractures (figure 1). A radiograph of the right knee showed arthrodesis of the knee joint with absent patella. The patient was worked up and planned for bilateral uncemented bi-polar hemiarthroplasty (as the patient was a middle-aged man who presented to us after 3 days).

Preoperative planning: True size X-ray was done and preoperative femur head and stem sizes were calculated for both poliotic limb. On the right side, canal appeared narrow and head and acetabulum appeared dysplastic. Hence Depuy CORAIL Dysplasia Size 6 Stem and same size Depuy total hip replacement set was also kept standby. The patient was operated first for the right-sided neck of femur.

Surgical technique: Under combined spinal and epidural anaesthesia patient was positioned supine. Initially, as the first step using image intensifier distal femur anatomy was identified and a 6.5 mm Steinmann's pin was inserted from the lateral aspect with the limb in neutral position parallel to the transcondylar line (in A.P.) and through the centre of the distal femur (in lateral) to aid in calculating the correct femoral stem version (figure 2, figure 3). We now have a reference for the

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Figure 1: X-ray PBH showing right sided subcapital and left sided basicervical neck of femur fracture



Figure 3: Clinical picture showing scar mark of arthrodesised knee with Steinmann's pin inserted from lateral side

neutral position of the limb. The patient was given lateral position and through a standard posterior approach, external rotators were cut close to the bone and a T shaped incision was taken over the joint capsule. Fracture site was exposed and neck cut was performed 1cm proximal to the lesser trochanter and head was delivered. The box cut was taken and the canal was reamed sequentially. The femoral stem of appropriate size (CORAIL Dysplasia Size 6 Stem) was inserted at an angle of 15° anteriorly (in the transverse plane) to the Steinmann's pin to maintain the version (figure 4). Head of size 47mm was inserted.

Traction and external rotation was applied and the joint was reduced. Joint was stable on flexion adduction and internal rotation of hip and acetabulum covering of implant was adequate. Capsule and external rotators were repaired adequately. The wound was closed in layers over



Figure 4: Intraoperative picture showing femoral stem version with respect to Steinmann's pin



Figure 2: X-ray knee (AP and Lateral) showing arthrodesised knee (with 3 screws) and Steinmann pin insertion parallel to transcondylar line

uum suction drain and dressing done. The Steinmann's pin was removed.

Postoperative: During the immediate post-operative period, the patient was clinically stable without any complication. Physiotherapy with isometric exercises was started after 48 hours. Check dress was done on 3rd post-op day and suture removal was done on postoperative day 12. The patient was then operated for left-sided neck femur fracture through the standard posterior approach and femoral stem version, in this case, was calculated by measuring the angle between the trial stem and transcondylar axis (figure 5).

The patient was discharged on the seventh postoperative day and was again reviewed 7 days later for suture removal. The patient was strictly advised to avoid excessive hip adduction and internal rotation (as in squatting) for the initial 6 weeks. The patient began full weight-bearing walking with a walker from the third postoperative day after left-sided uncemented bipolar hemiarthroplasty. Now postoperative six months, the patient is comfortable, pain-free and full weight-bearing walking with minimal support (figure 6). Power is Medical research council (MRC) grade 4 in right lower limb and MRC grade 5 in the left lower limb.



Figure 5: Post operative X-ray PBH AP operate with Bilateral uncemented Hemiarthroplasty

a
v
a
c

Discussion

Replacement surgery in a patient with polio with bilateral lower limb PPRP with one-sided knee arthrodesis with bilateral neck of femur fracture is challenging as usual manoeuvres of version assessment and manipulation cannot be used. The concerns in operating this case were

1. Bilateral Hypoplastic limb as a sequel of polio.
2. Inability to flex the knee (knee arthrodesis).
3. Inability to use the opposite limb and its bony landmarks as reference (bilateral neck of femur fracture).

There are high chances of component malposition in such situations and hence assessing correct version is of utmost importance. We have described a simple technique using Steinmann's pin inserted in distal femur to assess the correct version during bipolar hemiarthroplasty. Patil et al. [6] in a case of cemented hemiarthroplasty of the hip in a patient with ipsilateral knee arthrodesis used the K-wire inserted into the distal femur after determining the neutral version of limb comparing lesser trochanteric profile with the normal side which is not technically useful in our case with bilateral PPRP with bilateral neck of femur fracture.

Hence we inserted a 6.5mm Steinmann's pin in distal femur parallel to the transcondylar line (in A.P.) and through the centre of the distal femur (in lateral). This pin provided a simple reference for rotational orientation of the limb. Unlu et al. [7] and Yun [8] have described using posterior lesser trochanter line as a guide for determining the femoral stem version based on a CT based anatomical study. Furthermore, inserting the stem parallel to the "T-line" can be used in such cases. However, practical aspects of these references have not been studied yet and are difficult to use as a guide in a case with ipsilateral knee arthrodesis.

Conclusion

We describe a simple surgical technique of inserting a Steinmann pin in the distal femur in the coronal plane parallel to the transcondylar axis for intraoperative assessment of the neutral position of the limb and version of the femoral stem.

References

1. Hirata M, Nakashima Y, Ohishi M, Hamai S, Hara D, Iwamoto Y. Surgeon error in performing intraoperative estimation of stem anteversion in cementless total hip arthroplasty. *The Journal of arthroplasty*. 2013 Oct 1;28(9):1648-53.
2. Lewinnek GE, Lewis JL, Tarr RI, Compere CL, Zimmerman JR. Dislocations after total hip-replacement arthroplasties. *The Journal of bone and joint surgery. American volume*. 1978 Mar;60(2):217-20.
3. D'lima DD, Urquhart AG, Buehler KO, Walker RH, Colwell Jr CW. The effect of the orientation of the acetabular and femoral components on the range of motion of the hip at different head-neck ratios. *JBJS*. 2000 Mar 1;82(3):315-21.
4. Malik A, Maheshwari A, Dorr LD. Impingement with total hip replacement. *JBJS*. 2007 Aug 1;89(8):1832-42.
5. Patel AB, Wagle RR, Usrey MM, Thompson MT, Incavo SJ, Noble PC. Guidelines for implant placement to minimize impingement during activities of daily living after total hip arthroplasty. *The Journal of arthroplasty*. 2010 Dec 1;25(8):1275-81.
6. Patil ND, Patel HB, Hussain N, Saidane K. Cemented Hemiarthroplasty of the Hip in a Patient with Ipsilateral Knee Arthrodesis: Surgical Difficulties and Techniques. *Journal of orthopaedic case reports*. 2018 Jan;8(1):75.
7. Unlu MC, Kesmezacar H, Kantarci F, Unlu B, Botanlioglu H. Intraoperative estimation of femoral anteversion in cementless total hip arthroplasty using the lesser trochanter. *Archives of orthopaedic and trauma surgery*. 2011 Sep 1;131(9):1317-23.
8. Yun HH, Yoon JR, Yang JH, Song SY, Park SB, Lee JW. A validation study for estimation of femoral anteversion using the posterior lesser trochanter line: an analysis of computed tomography measurement. *The Journal of arthroplasty*. 2013 Dec 1;28(10):1776-80.

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