

Postoperative Total Sciatic Nerve Palsy After Cemented Bipolar Hemi-arthroplasty: Sciatic Nerve Found Sutured With Capsule

Dr. Praveen kumar pandey¹, Dr. Inder pawar², Dr. Raaghav rai verma³,
Dr. Jyoti gupta⁴

M.S. Ortho.; Senior resident doctor, Deptt. of Orthopaedics, ESI-PGIMS Model hospital, Basaidarapur,
New delhi;

M.S. Ortho.; Associate professor, Deptt. of Orthopaedics, ESI-PGIMS Model hospital, Basaidarapur,
New delhi;

M.S. Ortho.; Senior resident doctor, Deptt. of Orthopaedics, dr. RML Hospital, new delhi-110001;

M.D. Anaes., Senior resident doctor, Deptt. of anaesthesia, dr. RML Hospital, new delhi-110001;

Abstract: Sciatic nerve palsy is a recognized but a rare complication in post-operative period of hip arthroplasty. The prevalence of the same is very low with range of 0.3% to 4%. In review of literature, multiple cases of sciatic nerve palsy after total hip arthroplasty (THA) found to be reported but only few cases of sciatic nerve palsy post bipolar hemi-arthroplasty reported in literature. Various aetiologies have been reported in literature for the same i.e., direct trauma, compression from instruments, perforating parts of prosthesis, thermic effect of bone cement or cautery, due to limb lengthening or haematoma formation. Post-hip arthroplasty, neuropathy may be caused by external compression or by internal compression and ischemia due to postoperative oedema, hematoma formation or intraneural bleeding. We are hereby reporting our case as there is no case reported in literature with occurrence of sciatic nerve palsy post bipolar hemi-arthroplasty due to stitching of sciatic nerve with capsule as seen in our case during exploration re-surgery. In conclusion, when hip bipolar hemi-arthroplasty is planned for long standing fracture neck femur cases, sciatic nerve should always be explored and kept in vision during closure of hip joint capsule to avoid sciatic nerve palsy due to direct trauma by suture. This complication occurs because of deranged local soft tissue surroundings in long standing fracture neck femur cases especially in females.

Keywords: Sciatic nerve palsy, Hip arthroplasty, Bipolar hemi-arthroplasty, Stitching of sciatic nerve, Re-surgery.

I. Introduction

Sciatic nerve palsy after total hip arthroplasty (THA) as well as hemi-arthroplasty is an uncommon but disturbing event for both the surgeon and the patient. The reported incidence varies between 0.3 % and 4 % in primary THA and from 2.9% to 7.5% in revision surgeries (1,2,3,4,5,6,7,8).

Several contributory factors to sciatic nerve palsy post THA have been described in literature. These contributory factors can be divided into two groups-1) relating to the patient and 2) relating to the operation. Factors concerning the patient are – female sex, weight excess, an ankylosed hip, and congenital hip dislocation or subluxation. Some reported cases showed association between nerve palsy and pre-existing pathology of lumbar spine (6,9). Factors relating to the operation includes posterior or trans-trochanteric approach, revision surgery and limb lengthening procedures (4,5,6,7).

Although known contributory factors are easy to recognize, the exact origin of nerve palsy after THA is generally more difficult to identify. Commonly the precise aetiology of nerve injury is unknown or speculative (3,4,5,7).

No contributory factors documented in literature for postoperative sciatic nerve palsy in hip bipolar hemi-arthroplasty cases. But the factor mentioned above seems to be the same for sciatic nerve palsy post hip bipolar hemi-arthroplasty.

Nerve injury may arise during or after the operation. During the operation neuropathy may be caused by direct trauma, compression from instruments, perforating parts of the prosthesis or bone cement. Distraction of the nerve during limb lengthening may be the another reason for nerve damage (4,5,6,7). Following the operation nerve palsy may be caused by external compression or by internal compression and ischemia due to postoperative oedema, hematoma formation or intra-neural bleeding (4,5,6,7,10,11,12).

Additionally, when postoperative foot-drop occurs, localizing the level of lesion is often difficult, clinically as well as electro-myographically. However, accumulating evidence from literature suggests that the nerve injury occurs mainly proximal to the level of arthroplasty and affects the sciatic nerve or the peroneal division of the sciatic nerve (4,5,8).

In review of literature, not a single case found to be reported of sciatic nerve palsy after hip bipolar hemi-arthroplasty due to stitching of sciatic nerve with hip joint capsule which prompt us to report this case.

II. Case Report

A sixty year-old woman presented to our emergency department with a 4 weeks old right neck of femur fracture. The orthopaedic examination revealed external rotation posture of the lower extremity, painful and limited range of motion of the right hip, and unable to do active straight leg raising on affected side. Medical comorbidities included mild hypertension and controlled diabetes mellitus on oral medications. A decision was made to give her skin traction with 5 kg weight until day of surgery and then proceed with bipolar hemiarthroplasty after pre-anaesthetic check-up (PAC) clearance. After 5 days of admission, the patient underwent bipolar hemiarthroplasty right hip through a posterolateral approach under regional anaesthesia (CSE).

Intermittent pneumatic compression device and compression stockings were used immediately after the operation. Postoperatively, the patient received two units of packed red blood cells to replenish the blood loss during surgery. The patient had an uneventful medical course and recovery. Neurovascular examination of the right lower-extremity post-operatively revealed normal distal vascular pulsations but complete sensation loss below knee over right side, paraesthesia in the right lower extremity and complete absence of ankle & foot movements over right side. Two hours later, physical examination confirmed a total distal sciatic nerve dysfunction. A radiograph of the hip confirmed good position and fixation of the components. Patient was kept on bed with right lower limb in flexion at hip and knee to relieve the stretch on sciatic nerve which was then suspected to be the cause of sciatic nerve palsy. The drain (approx. 200 ml) removed on the first postoperative day, and on re-examination there was no improvement seen in sciatic nerve function over the period of two days. A decision was made to take the patient back to the operating room and exploration of sciatic nerve. Two days after first surgery, a re-exploration was performed with the patient under regional anaesthesia and sciatic nerve was found to be taut distally. Exploration of sciatic nerve proximally near hip joint capsule showed a stitch passing through middle of sciatic nerve and hip joint capsule. After cutting the suture, tautness in the sciatic nerve gets relieved and the sciatic nerve was found to be intact along the course of exposure. The wound was closed in layers over drain that remained in place for forty-eight hours. An ankle-foot orthosis (AFO) was ordered post-operatively to prevent equinus contracture and to help with walking. The total duration of the hospital stay was fourteen days. At the three-month postoperative visit, the results of the neurological examination were unchanged, with total sciatic nerve palsy. However, the patient reported a subjective improvement in the sensation of the dorsum of the right foot. Patient was followed up regularly thereafter. At the time of the latest follow-up, at eight months postoperatively, neurological examination revealed improvement, with total recovery from the right sciatic nerve motor palsy.

III. Discussion

Immediate as well as delayed sciatic nerve palsy is a recognized but uncommon complication after THA. It may be caused by direct injury, compression from a retractor, traction, due to limb lengthening, thermal injury from bone cement or cautery, or hematoma formation (13-16). Rarely, it can be a complication of hematoma formation in the lumbar spine subsequent to traumatic insertion of an epidural catheter or a continuous lumbar plexus block (17). But in our case, post-operative sciatic nerve palsy was of immediate type and cause found to be stitching of sciatic nerve with hip joint capsule during exploration re-surgery. This cause is not reported in literature till now for post hip arthroplasty sciatic nerve palsy.

Several studies have suggested that the risk of sciatic nerve palsy is higher for women than for men (2,3,7,8). According to Weber et al. (8), the sex of the patients was the only factor that showed any correlation with the development of neuropathy following hip arthroplasty. In our case too, the patient was a female. Women showed a definite predisposition to this complication, perhaps due to their smaller bulk of muscle and deranged local soft tissue surroundings because of long standing fracture neck of femur as seen in our case.

Several studies documented in literature in which patients developed hematoma induced sciatic nerve palsy mostly of delayed type after primary THA (14,17-19). All the cases reported in the literature were on some kind of thrombo-prophylaxis for one or the other reason. But, this is not the reason in our case as there is no coagulation abnormality, thrombo-prophylaxis and hematoma found during re-surgery.

The clinical suspicion of a hematoma compressing the sciatic nerve should always be ruled out, if patient is on thrombo-prophylaxis, and when a hematoma is confirmed, the sciatic nerve should be decompressed expeditiously, as soon as the anticoagulation effects of the thrombo-prophylaxis have been reversed. There is no definite consensus with reference to the time interval from the onset of sciatic nerve irritation to decompression, and the final clinical outcome is unclear.

In case-series of Farrell et al., preoperative diagnosis of developmental dysplasia of the hip or posttraumatic arthritis, the use of a posterior approach, lengthening of the extremity, and use of an uncemented femoral implant found to increase the odds ratio of sustaining a sciatic nerve palsy. The majority of the sciatic nerve deficits in their series, whether complete or incomplete, did not fully resolve (13). In our case, we have exposed the hip joint using posterior approach which is more prone to sciatic nerve palsy as per literature but our patient recovered completely after eight months post re-surgery.

In review of literature, we didn't found a single case reported of total sciatic nerve palsy post bipolar hemi-arthroplasty done for old fracture neck femur case due to stitching of sciatic nerve with hip joint capsule.

So, hereby we report a case of immediate onset total sciatic nerve palsy, which she developed as a consequence of stitching the sciatic nerve through middle of the substance and hip joint capsule with a 1-0 vicryl suture, found intra-operatively during re-surgery. This report adds to the existing evidence regarding a serious complication of total sciatic nerve palsy after bipolar hemi-arthroplasty that can occur due to disorganized local soft tissue surroundings seen in long standing fracture neck femur cases.

IV. Conclusion

This case report is intended to add to the existing evidence regarding serious complication of total sciatic nerve palsy following hip bipolar hemi-arthroplasty. As in our case, when bipolar hemi-arthroplasty is planned for long standing fracture neck femur cases, sciatic nerve should always be explored and kept in vision during closure of hip joint capsule to avoid sciatic nerve palsy due to direct trauma by suture. This complication occurs because of deranged local soft tissue surroundings in long standing fracture neck femur cases especially in females.

Compliance With Ethical Standards:

Funding: Not Applicable (Na).

Conflict Of Interest: Author 1 to 4 declares that they have no conflict of interest.

Ethical Approval: All procedures performed in our case report involving human participant were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from the patient included in our study.

References

- [1]. Amstutz H.C., Ma S.H., Jinnah R.H., Mai L.(1982) Revision of aseptic loose total-hip arthroplasty. Clin. Orthop.; 170:21-33.
- [2]. Edwards B.N., Tullos H.S., Noble P.C.(1987) Contributory factors and etiology of sciatic nerve palsy in total hip arthroplasty. Clin.orthop.; 218: 136-241.
- [3]. Johanson N.B., Pellici P.M., Tsairis P., Salvati E.A.(1983) Nerve injury in total hip arthroplasty. Clin. Orthop.; 179: 214-222.
- [4]. Schmalzried T.P., Amstutz H.C., Dorey F.J.(September 25, 1991) Nerve palsy associated with total hip replacement. Presented at: "Total hip replacement : changing times; what works and what doesn't". Massachusetts.
- [5]. Schmalzried T.P., Amstutz H.C., Dorey F.J.(1991) Nerve palsy associated with total hip replacement. J. Bone Joint Surg.; 73-A: 1074-80.
- [6]. Simon J.P., Van Delm I., Fabry G.(1993) Sciatic nerve palsy following hip surgery. Acta. Orthop. Belg.; 59: 156-162.
- [7]. Solheim L. F., Hagen R.(1980) Femoral and sciatic neuropathies after total hip arthroplasty. Acta Orthop. Scand.; 51: 531-34.
- [8]. Weber E.R., Daube J.R., Coventry M.B.(1976) Peripheral neuropathies associated with total hip arthroplasty. J. Bone Joint Surg.; 58-A, 66-69.
- [9]. Stoehr M.(1978) Traumatic and postoperative lesions of the lumbosacral plexus. Arch. Neurol.; 35: 757-760.
- [10]. Lindau L. A.(1974) Uitval vande N. femoralisen N. cutaneous femoris lateralis ten gevolge van een hematoom in de M. iliopsoas. Ned T. Geneesk; 118: 1609-10.
- [11]. Lundborg G.(1975) Structures and function of the intraneural microvessels as related to trauma, edema formation and nerve function. J. Bone Joint Surg.; 57-A: 938-948.
- [12]. Wagner H.(April 21-23, 1993) Revision of femoral stem with important loss of bone stock. First European congress of orthopaedics, paris; pp: 64-74.
- [13]. Farrell CM, Springer BD, Haidukewych GJ, Morrey BF.(2005) Motor nerve palsy following primary total hip arthroplasty. J Bone Joint Surg Am.; 87(12):2619-25.
- [14]. Butt AJ, McCarthy T, Kelly IP, Glynn T, McCoy G. (2005 Nov) Sciatic nerve palsy secondary to postoperative haematoma in primary total hip replacement. J Bone Joint Surg Br.; 87(11):1465-7.
- [15]. Neel J, Groussin P.(1959 Oct) 2 Cases of paralysis of the external popliteal sciatic nerve caused by hematoma]. Rev Neurol (Paris); 101:552-4.
- [16]. Sorensen JV, Christensen KS.(1992 Dec) Wound hematoma induced sciatic nerve palsy after total hip arthroplasty. J Arthroplasty.; 7(4):551.
- [17]. Ben-David B, Joshi R, Chelly JE.(2003 Oct) Sciatic nerve palsy after total hip arthroplasty in a patient receiving continuous lumbar plexus block. Anesth Analg.; 97(4):1180-2.
- [18]. Beksac x BP, Della Valle AG, Salvati EA.(2009 Feb) Acute sciatic nerve palsy as a delayed complication of low-molecular-weight heparin prophylaxis after total hip arthroplasty. Am J Orthop.; 38(2):E28-30.
- [19]. WeilY, MattanY, GoldmanV, Liebergall M.(2006 Apr) Sciatic nerve palsy due to hematoma after thrombolysis therapy for acute pulmonary embolism after total hip arthroplasty. J Arthroplasty ; 21(3):456-9.