



Incidence of Urinary Retention following Cervical Corpectomy with Iliac Bone Autografting in Single Institution

Sanjeev Kumar Pandey

Department of Neurosurgery, Christian Medical College and Hospital, Vellore

Abstract

Objective: To study the incidence of post operative urinary retention after the cervical corpectomy with iliac bone auto-grafting.

Methods: In this retrospective study, data were collected from patients undergoing cervical corpectomy with autologous iliac bone grafting by a single surgeon managed in a neurosurgery unit between July 2016 and October 2016. Preoperative Nurick grade, post void residue, duration of surgery and need for catheterization postoperatively were studied.

Results: There were 7 patients (mean age, 48.7 years, range, 26 to 59 years). Male to female ratio was 6:1. Single level corpectomy was done for 3 patients (42.9%), two level for 3 patients (42.9%) and three level corpectomy was done for 1 patient (14.3%). All patients underwent iliac bone auto-grafting except for the fibular autograft for a 3 level corpectomy. Most common reason for corpectomy was ossified posterior longitudinal ligament (42.9%). Most of the patients (42.9% each) were Nurick grade 3 or 4 and modified JOA score of 10 (42.9%) preoperatively. Mean post void residue was 34 mL measured preoperatively. Time under general anaesthesia was 4.5-7 hours (mean of 5.5 hours). All patients underwent cervical corpectomy using the standard technique. Operative bone defect was filled with iliac bone autograft for 6 patients and with fibular autograft for 1 patient. 2 patients were catheterized preoperatively. Out of the remaining 5 patients, 4 (80 %) needed postoperative urinary catheterization.

Conclusions: Cervical corpectomy with iliac bone autografting is associated with significant iliac operative site pain leading to immobilization. Most of the patients develop urinary retention and need indwelling foley's catheterization. Preoperative catheterization may be an effective method to avoid bladder distension in these patients and could be practiced in all the patients undergoing cervical corpectomy with iliac bone autografting. Preoperative post void residue does not relate to incidence of retention postoperatively.

Keywords: urinary catheterization; cervical corpectomy; iliac bone autograft; surgery

Introduction

Cervical corpectomy patients with iliac bone autograft are at risk of post-operative urinary retention (POUR). Undetected POUR can result in bladder distension with its complications. Some centers opt to catheterize the patient preoperatively and some do not catheterize them as a routine, preoperatively. Urinary catheterization is a known risk factor for the urinary tract infection (UTI). Several studies in past have analyzed the incidence of UTI with short term catheterization postoperatively. In this study, we have evaluated incidence of preoperative catheterization for patients undergoing cervical corpectomy with autologous iliac bone grafting and looked at the possible factors associated with postoperative urinary retention retention, such as preoperative post void residue (PVR), modified Nurick grade, modified Japanese orthopedics association score (JOA score) and duration of the surgery.

Materials and Methods

Patients: In this retrospective study, patients with various etiologies causing cervical cord compressive myelopathy who underwent central cervical corpectomy and autologous bone grafting by a single surgeon (BVJ) from July 2016 to October 2016 were included. Patients who underwent corpectomy other than cervical level were excluded from the study.

Clinical features: All the patients had cervical compressive myelopathy, which was assessed in terms of modified Nurick grade and modified JOA score. Patients were included irrespective of their urinary complaints.

Imaging: All the patients had preoperative X-ray cervical spine and MRI cervical spine showing cervical cord compression. Ultrasonography of the KUB region (Kidney, Ureter and Bladder) was done preoperatively in 5 patients to assess for the post void residue and to look for the back pressure changes, if any. All the images were accessed through the institutional picture archival and communication system (PACS).

Surgery: The primary treatment of all the 7 patients was central cervical corpectomy with autologous bone grafting. 6 patients underwent iliac bone auto-grafting and 1 patient, who underwent three level corpectomy received fibular autograft. Duration of general anesthesia was assessed for all the patients.

Urinary catheter placement: Postoperatively, the need for urinary catheterization, duration of the retention following extubation and total voided volume after catheterization were evaluated.

Results

Patients: There were 7 patients, (mean age, 48.7 years, range, 26 to 59 years). Male to female ratio was 6:1. Most common reason for corpectomy was ossified posterior longitudinal ligament (42.9%) (Table 1).

Table 1: Etiology for undergoing cervical corpectomy

Etiology	No of patients, n=7 (%)
OPLL	3 (42.9)
Traumatic listhesis	2 (28.6)
CSM	1 (14.3)
Neoplasm	1 (14.3)

CSM: Cervical spondylotic myelopathy, OPLL: Ossified posterior longitudinal ligament

Most of the patients (42.9% each) were Nurick grade 3 or 4 preoperatively (Table 2) with modified JOA score of 10 (Table 3).

Table 2: Preoperative modified Nurick grade

Preoperative modified Nurick grade	No of patients, n=7 (%)
1	0 (0)
2	0 (0)
3	3 (42.9)
4	3 (42.9)
5	1 (14.3)

Table 3: Preoperative modified JOA score

Preoperative modified JOA score	No of patients, n=7 (%)
15 or more	0 (0)
13-14	2 (28.6)
11-12	2 (28.6)
9-10	3 (42.9)
8 or less	0 (0)

JOA: Japanese orthopedic association score

3 patients (60%) had post void residue (PVR) less than 50 mL, 2 patients (40%) had PVR between 50-60 ml. In two patients, PVR was not measured preoperatively.

Surgical aspects

Single level corpectomy was done for 3 patients (42.9%), two level for 3 patients (42.9%) and three level corpectomy was done for 1 patient (14.3%). Operative bone defect was filled with iliac bone autograft for 6 patients and with fibular autograft for 1 patient. Time under general anesthesia was 4 hours 30 minutes to 7 hours (mean of 5 hours and 30 minutes), Table 4.

Table 4 : Duration of general anesthesia

4.5 - 7 hours (Mean 5.5 hours)	No of patients, n=7 (%)
4 to 4.5 hrs	2 (28.6)
4.6 – 5 hrs	1 (14.3)
5.1-5.5 hrs	1 (28.6)
5.6 – 6 hrs	2 (28.6)
> 6 hrs	1 (14.3)

Postoperative urinary retention (POUR) and morbidity:

2 patients were catheterized preoperatively. Reasons for preoperative urinary indwelling catheter were planned 360 degree fusion for first patient and 3 level corpectomy for the second patient. 1 patient out of the remaining 5 (20%) did not need catheterization. 4 of the 5 patients (80 %) needed postoperative urinary catheterization. Indication for all the patients requiring urinary catheter placement was inability to void despite attempts at voiding, suprapubic ice cube sponging. All the patients were wide awake (15 GCS score) at the time of retention. After putting the catheter, urinary volume was in range of 600 mL to 1000 mL (mean 775 mL). Time to urinary catheterization following extubation was from 4 hours to 7 hours (mean of 5 hours and 40 minutes). None of these patients developed any urinary catheter related complication. There was no perioperative surgical mortality. For the postoperatively catheterized group patients, urinary catheter was removed for all patients within 5 days of postoperative stay in ward. None of the patients needed re-catheterization. Out of the 2 patients who were catheterized preoperatively, 1 was voiding without catheter and 1 was discharged with indwelling catheter (360 degree fusion).

Discussion

Postoperative urinary retention (POUR) is defined as inability to pass urine despite the urinary bladder fullness. [1] Several studies have mentioned various cut off limits for the urinary retention from 400 mL to 600 mL. [2,3,4] POUR causes distension of the urinary bladder with large volume of the retention, which may result in further micturition problems in future. [5] Surgery in the hip and pelvis region have been associated with the post operative urinary retention. Multiple series have documented the incidence of POUR as 12 to 84%. [6, 7, 8] In our patients, immobilization along with graft site pain are contributing factors for difficulty in voiding. The most common method being utilized in hospitals for the relief of POUR is insertion of an indwelling urinary catheter. Preoperative urinary catheterization in patients undergoing cervical corpectomy with use of iliac bone autograft is a possible solution to prevent over-distention of the urinary bladder and it's complications. Postoperatively once the patient is ambulant, the catheter can be removed. This approach helps in prevention of urinary complications with minimal risk of UTI. To the best of our knowledge, there were no previous studies which mention specifically about incidence of POUR in cervical corpectomy patients undergoing IBG auto-grafting. 80% patients, who were not catheterized preoperatively in our study developed postoperative urinary retention and needed catheterization, which is in the higher range as mentioned in the previous studies done for hip and pelvis surgery. [6,7,8]

Conclusions

80% of the patients undergoing cervical corpectomy with iliac crest autograft, develop urinary retention and need postoperative urinary catheterization. Preoperative

catheterization is an effective method to avoid distension of the bladder and could be practiced for all the patients undergoing cervical corpectomy with iliac bone auto-grafting. Preoperative post void residue does not relate to incidence of retention postoperatively.

Conflict of Interest

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

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