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SURGICAL MANAGEMENT OF SACRAL TUMORS PERSPECTIVES AND OUTCOME ANALYSIS OF 15 YEARS PERIOD A SINGLE INSTITUTIONAL EXPERIENCE.

Oncology

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ABSTRACT

Objective: Sacral tumours are rare pathologies. Their management generates a complex surgical problem, as they usually are diagnosed in advanced stages. The evaluation and complex treatment of these rare tumours require a multidisciplinary approach, optimally at institutions with comprehensive care and experience. The aim of this study is to analyse retrospectively the perspective and outcome after surgical management of sacral tumours over the period of 15 years from our institution.

Materials and Methods: This is a retrospective study of the patients who underwent sacrectomy between January 2002 and December 2016 in our institution. Patients underwent any of the following three types of sacrectomy: total, subtotal or partial. Sacrectomy was performed by either one of the following approaches: posterior, abdomino-sacral either as sequential or staged approach. Spino-pelvic reconstruction was not performed in any of the patients. Patients were analysed for functional outcome (MSTS score) morbidity, and survival (Kaplan Meier method).

Results: Twenty-seven patients underwent sacrectomy of which 12 were partial, 8 were subtotal and 7 were total sacrectomy. Most common pathology in our study was Giant cell tumour followed by chordoma. There were fourteen males and thirteen females. 51.8% of patients had bowel and bladder disturbances post operatively 70.3% had wound complications. Median follow up was 36 months (Range 6-180 months). Five year OS was 72.1%. Distant metastasis occurred in 1 patient (3.71%). 10 (37.03%) had good outcome and 6 (22.22%) had poor outcome. Staged approach had reduced morbidity.

Conclusion: En bloc resection with adequate margin can achieve long term local oncological control. Sacrectomy once considered as a morbid procedure, can now be safely performed with improved surgical techniques. Our experience in sacrectomy with staged approach has shown to achieve lesser perioperative morbidity, better functional outcome and comparable long-term survival.

KEYWORDS

Introduction

Sacral tumors are rare pathologies presenting in young as well in old age. The common primary tumour involving sacrum is chordoma followed by giant cell tumour, chondrosarcoma and plasmacytoma, rarely infiltration of rectal cancers and metastasis. Surgical management of sacral tumors is challenging due to complex anatomic structures and rich blood supply. First sacrectomy was performed by Bowares et al in 1948, while the staged procedure was done by Hays et al in 1952.

Methods

This is a retrospective study of patients who underwent sacrectomy in our department between January 2002 and December 2016 in our institution. Patient underwent any of the three types of following sacrectomy total, subtotal or partial. Sacrectomy was performed by one of the following procedures posterior, abdomino-sacral either as a sequential or staged operation. Spino pelvic reconstruction was not performed in any of the operation. Patients were analysed for morbidity, functional outcome and survival.

Anterior approach was performed trans-peritoneal to expose the anterior aspect of tumors. The internal iliac vessels ligated, retro rectal dissection was done to isolate the rectum. In the posterior approach, dissection was done up to the level of S1 and osteotomy was done to complete sacrectomy. Closure was done either primarily or by gluteal advancement flap.

Results

Twenty-seven patients underwent sacrectomy of which 12 were partial, 8 were sub total, 7 were total sacrectomy. There were 14 males and 13 females. Most common histology was giant cell tumor followed by chordoma. The average age at diagnosis was 42 years (ranged 13-65 years). Sequential abdomino sacral approach was used in 9 patients. Staged approach done for 14 cases. For two patients with small posteriorly dominant lesions partial sacrectomy was done by posterior approach. Combined abdomino-lateral approach was done in 2 cases. Post operatively 70.3% had wound complications. Bowel and bladder dysfunction was noted in 51.8% of patients. Single mortality was noted in a patient with chondrosarcoma of sacrum in the perioperative period.

Median follow up was 36 months (ranged 6 – 180 months). 5-year survival rate was 72.1% distant metastasis in 1 patient. Mortality rate (n=6) was 22.2%. Based on MSTS score 11 (40.7%) patients had excellent outcome, 10 patients 9 37.03%) had good outcome, 6 patients (22.2%) had poor outcome. Comparing staged approach with sequential approach the morbidity had reduced.

Approach

Surgical management is difficult owing to complex anatomy of sacral region and reconstruction. Various approaches for sacrectomy are anterior approach, posterior approach for posteriorly dominant tumors, sequential anterior – posterior, abdomino lateral and perineal approach. The two staged approach described by Wanebo and Marcove is an adaptive approach commonly done in our institution. In this approach after completing the anterior dissection, posterior dissection was done after one or two days. It had least morbidity like less blood loss, less operating time and better wound healing.

Types

Three types of sacrectomy were done in our institution viz. total, subtotal and partial sacrectomy. Total sacrectomy is considered when the level of amputation is at the level of L5 S 1 disc with complete removal of sacrum. Subtotal sacrectomy when the level of amputation is at the body of S1 vertebra. Partial sacrectomy was considered when the level of amputation is at or below the body of S2. Bowel and

bladder morbidity was more with total sacrectomy in our experience, due to complete denervation of pelvic parasympathetic fibres.

Complications

The most common complication was wound morbidity, infection and dehiscence (70.3%). Wound infection and dehiscence were more in primary closure when compared to gluteal advancement flap. Wound infection and dehiscence were mostly managed conservatively but some patients required split skin graft and/or gluteal advancement flap. Bowel and bladder disturbances occurred in 51.8% of cases mostly with total sacrectomy. Pre-operative counseling, post-operative bladder (self catheterization) and bowel training, markedly reduced this complication.

Reconstruction

Because of the instability and discontinuity between the lumbar spine and pelvis most surgeons perform Spino-pelvic reconstruction to facilitate early mobilization and better ambulation. Spino pelvic reconstruction was done by various methods like Galveston reconstruction system, sacral bar and compression rods. We never perform Spino-pelvic reconstruction as we believe the extensive post-operative fibrosis between the spine and pelvis stabilizes them.

Conclusion

En bloc resection with adequate margin can achieve long term local oncological control in sacral tumors. Sacrectomy once considered as a morbid procedure can now be safely performed with improved surgical techniques.Our experience in sacrectomy with staged approach has shown to achieve lesser peri-operative morbidity, better functional outcome and comparable long-term survival.

Table 1 Pathology

Sl.No.	Pathology	Number
1	Giant cell tumor	14
2	Chordoma	8
3.	Rectum involving sacrum	1
4	Others 1.Hemangioendothelioma 2.Chondrosarcoma 3.Plasmacytoma 4.Myxo papillary Ependymoma	1 1 1 1

Table 2 Types of Sacrectomy

Sl.No.	Types of Sacrectomy	Number
1	Total Sacrectomy	7
2	Subtotal sacrectomy	8
3.	Partial Sacrectomy	12

Table 3 Complication

Sl.No.	Complications	Number
1	Wound infection	21
2	Wound dehiscence	6
3.	Bowel and bladder disturbances	14
4.	Deep vein thrombosis	1
5	Rectal prolapse	1

Table 4 Comparison of sequential and staged approach

Sl.No.	Approach	Number	Mean operating time	Wound complication rate
1	Sequential	9	8 hrs	77.7%
2.	Staged	11	6 hrs	42%

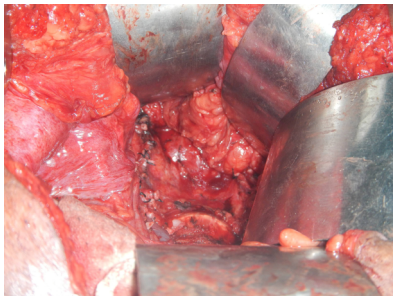

Figure 1 Staged Approach Showing anterior dissection

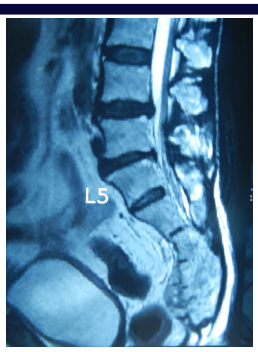

Figure 2 MR imaging shows sacral tumor involving S2

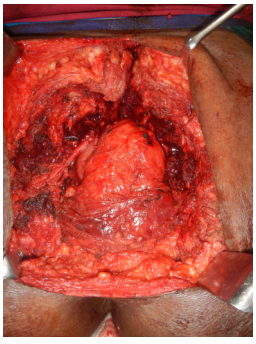

Figure 3 Staged Approach Showing posterior dissection

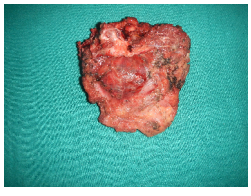

Figure 4 PostOperative specimen of subtotal Sacrectomy

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