

Case Report

Sacroiliac stabilization for sacral metastasis: A case series

Morenikeji A. Buraimoh, Charles C. Yu, Michael P. Mott, Gregory P. Graziano

Department of Orthopaedic Surgery, Henry Ford Health System, Detroit, Michigan, USA

E-mail: Morenikeji A. Buraimoh - aburaimoh@gmail.com; *Charles C. Yu - cyyu1@hfhs.org; Michael P. Mott - mmott2@hfhs.org;

Gregory P. Graziano - ggrazia1@hfhs.org

*Corresponding author

Received: 28 August 17 Accepted: 06 September 17 Published: 06 December 17

Abstract

Background: The sacrum is a rare location for spinal metastasis. These lesions are typically large and destructive by the time of diagnosis, making treatment difficult. When indicated, surgical stabilization offers pain relief and preserves independence in patients with impending and acute pathological sacral fractures.

Case Description: Three consecutive patients presented with sacral metastases. After either failing radiation therapy or presenting with acute fracture and instability, the patients underwent intralesional excision, bilateral L4 to ilium fusion with instrumentation, and sacroiliac (SI) screw fixation. Pain improved after surgery, and there were no wound healing complications. Two patients could continue walking without any assistive device, while one patient required a walker.

Conclusion: Stabilization with combined modified Galveston fixation and SI screw fixation relieves pain and allows maintenance of independence in patients with sacral metastasis.

Key Words: Iliosacral screw, sacral metastasis, sacroiliac fixation

Access this article online

Website:

www.surgicalneurologyint.com

DOI:

10.4103/sni.sni_324_17

Quick Response Code:



INTRODUCTION

Metastatic tumors comprise the majority of malignant sacral tumors.^[4] As medical therapies continue to improve, cancer patients will develop more metastatic lesions.^[3,7] Surgical intervention is indicated in patients with intractable axial or radicular pain despite a trial of medical and/or radiation therapy.^[5] Surgery is also indicated in patients with neurologic dysfunction or mechanical instability secondary to structural compromise.^[2] In each case, the goals of surgery are to relieve pain and preserve independence.

Sacral metastatic disease

Metastatic disease of the sacral spine is rare and occurs in approximately 5–10% of cancer patients. Meanwhile, the prevalence of asymptomatic and symptomatic metastatic lesions throughout the entire spine may be as high as 70% and 14%, respectively.^[4,7]

Surgical management of sacral metastatic disease

The management of metastatic sacral lesions is complicated as they are often large and destructive by the time they are diagnosed [Figure 1].^[6] Potential risks of surgery include wound-healing complications, infection, implant failure, implant loosening, venous thromboembolism, iatrogenic nerve injury, and cerebrospinal fluid leak.^[6] Many patients opt for surgery for adequate pain relief and/or improved mobility.^[2,4,5]

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Buraimoh MA, Yu CC, Mott MP, Graziano GP. Sacroiliac stabilization for sacral metastasis: A case series. *Surg Neurol Int* 2017;8:287. <http://surgicalneurologyint.com/Sacroiliac-stabilization-for-sacral-metastasis:-A-case-series/>

Modern surgical techniques for lumbopelvic fixation include the modified Galveston technique,^[5] use of dual iliac screws,^[2] and use of a three or four-rod construct.^[8]

CASE REPORT

Data from three consecutive patients with sacral malignancies undergoing lumbopelvic fixation were evaluated [Table 1]. There was one female and two males, averaging 46.7 years of age (range 42–53 years). All patients had radicular pain for an average of 22 weeks (range 2–36 weeks); and were followed for an average of 44 weeks. One patient succumbed to his disease 4 months after surgery.

Imaging and surgical fixation

All patients underwent computed tomography (CT) and magnetic resonance imaging (MRI) scans preoperatively. They underwent decompression and instrumented fusion utilizing the modified Galveston/iliosacral screw technique [Figure 2].

Case 1

Clinical presentation

A 53-year-old female with remote history of granulosa cell ovarian cancer presented with increasing sciatic/radicular pain and gluteal numbness. CT showed a very large expansile lytic lesion involving the entire right sacral ala, eroding through the right SI joint and dorsal cortex, with accompanying visceral and other bony metastases. Two months later, following biopsy confirmation of recurrent ovarian cancer and after failed nonoperative

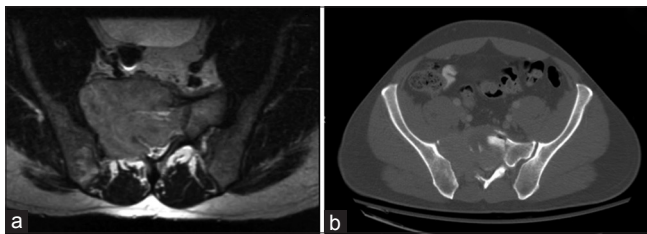


Figure 1: A 42-year-old male with metastatic plasma cell neoplasm. (a) MRI of a lytic sacral lesion with encroachment on neural elements. (b) CT shows involvement of the entire right sacral ala and most of the SI body with a pathologic fracture

management [e.g., including and palliative radiation (30 gray)], she underwent surgery performed by a multidisciplinary team.

Lumbosacral/Lumbopelvic surgery

The lumbosacral spine was approached using a standard posterior midline exposure from L4 to the sacrum. The tumor was partially debulked and pedicle screws were inserted bilaterally at L4 and L5 (under fluoroscopic guidance). As the right S1 pedicle was destroyed, only a left S1 pedicle was inserted. Bilateral iliac bolts were inserted at the posterior superior iliac spine. Two rods were applied, and cross-connectors were used to connect the rods to the iliac bolts. Two cross-clamps were used to increase the strength of the construct. The orthopedic oncologist performed an intralesional excision followed by the percutaneous right SI screw placement.^[1] Crushed cancellous allograft and adult mesenchymal stem cell-based graft was applied lateral to the instrumentation over the SI joints and into the tumor defect.

The patient sustained immediate pain relief, stayed 4 postoperative days, and was discharged home. The only complication was left iliac bolt irritation. At 82 postoperative weeks, the patient had occasional back pain, was on no pain medication, and ambulated without difficulty. The follow-up CT confirmed solid lumbar and iliolumbar fusion with partial SI fusion. Cases 2 and 3 are summarized in Table 1.

DISCUSSION

The goals of surgery for symptomatic sacral metastases include relief of pain/radiculopathy and the preservation of function. This typically requires decompressing the neural elements and attendant lumbopelvic stabilization. The literature demonstrates that intralesional excision accompanied by instrumented fusion meets the intended goals and allows patients to maintain or improve their ambulatory status postoperatively.^[2,4,5] In the three cases presented, the operative time and blood loss were high, but there were no wound healing complications or infections. Two patients maintained walking

Table 1: Case Summaries

	Case 1	Case 2	Case 3
Age	53	42	45
Sex	F	M	M
Diagnosis	Ovarian granulosa cell cancer	Plasma cell neoplasm	Renal clear cell carcinoma
Metastasis	R sacral ala & SI joint	R sacral ala & S1 body	R sacral ala & SI joint
Surgery	L4-ilium fusion, R SI screw	L4-ilium fusion, 2x R SI screws	L4-ilium fusion, R SI screw
Operative Time (min)	326	382	292
Estimated Blood Loss (mL)	425	550	400
Length of Stay (day)	4	5	3
Followup Time (week)	82	47	16

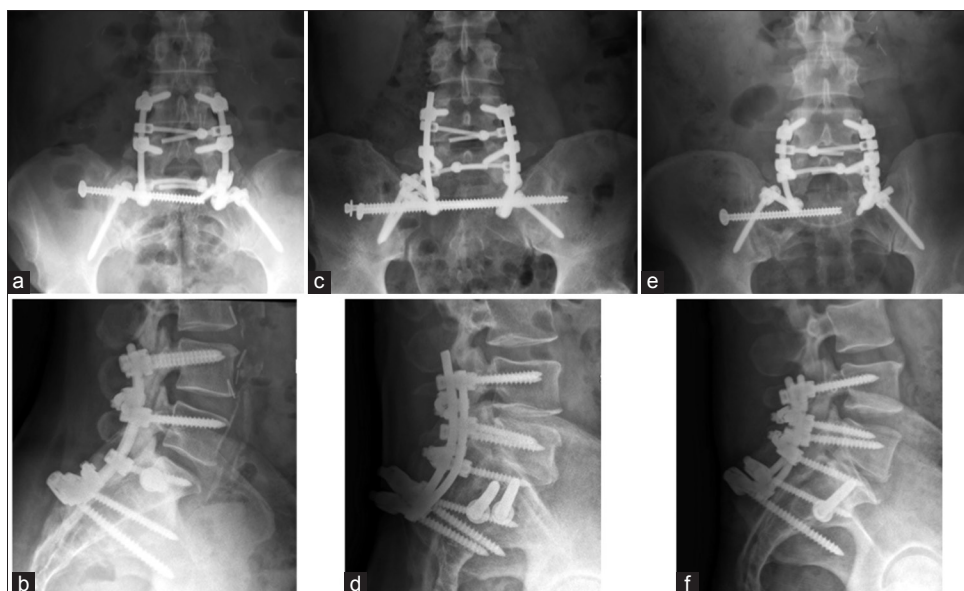


Figure 2: Postoperative X-rays of Case 1 (a and b), Case 2 (c and d), and Case 3 (e and f)

independence, whereas one was unable to wean off his walker before he passed away.

Technical aspects of sacropelvic surgery

Ideally, instrumentation of the sacrum and pelvis should occur prior to impending fracture.^[7] Interestingly, the study by Gunterberg supports the notion that failure is often lateral in the sacral ala.^[3] In orthopedic trauma surgery, the SI screw is commonly used to treat sacral fractures. We believe that it adds direct support to the SI joint, which is eroded by the tumor. Meanwhile, the SI screw fixation adds limited morbidity to the operation.

Multidisciplinary approach

The multidisciplinary approach, including medical oncology, radiation oncology, surgical oncology, and spinal surgeons is essential to optimize the management/outcomes of spinal surgery dealing with metastatic disease to the sacrum.^[3,6,8] Here, collaboration among the services facilitated the care of these three patients.

CONCLUSION

Decompression and instrumented fusion of symptomatic sacral metastatic disease utilizing the modified Galveston

and SI fixation system is both safe and effective. This technique provided excellent pain relief, helped maintain postoperative mobility, and independence.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Chip Routt ML, Meier MC, Kregor PJ, Mayo KA. Percutaneous iliosacral screws with the patient supine technique. *Oper Tech Orthop* 1993;3:35-45.
2. Fujibayashi S, Neo M, Nakamura T. Palliative dual iliac screw fixation for lumbosacral metastasis. Technical note. *J Neurosurg Spine* 2007;7:99-102.
3. Gunterberg B, Romanus B, Stener B. Pelvic strength after major amputation of the sacrum. An experimental study. *Acta Orthop Scand* 1976;47:635-42.
4. Kollender Y, Meller I, Bickels J, Flusser G, Issakov J, Merimsky O, et al. Role of adjuvant cryosurgery in intralesional treatment of sacral tumors. *Cancer* 2003;97:2830-8.
5. McGee AM, Bache CE, Spilsbury J, Marks DS, Stirling AJ, Thompson AG. A simplified Galveston technique for the stabilisation of pathological fractures of the sacrum. *Eur Spine J* 2000;9:451-4.
6. Quraishi NA, Giannoulis KE, Edwards KL, Boszczyk BM. Management of metastatic sacral tumours. *Eur Spine J* 2012;21:1984-93.
7. Rose PS, Buchowski JM. Metastatic disease in the thoracic and lumbar spine: Evaluation and management. *J Am Acad Orthop Surg* 2011;19:37-48.
8. Vrionis FD, Small J. Surgical management of metastatic spinal neoplasms. *Neurosurg Focus* 2003;15:E12.