POSTER 5

Title: Is Reconstruction Necessary Following Iliosacral Resection? A Comparison of Outcomes from Two Tertiary Sarcoma Centers

Authors: Matthew T. Houdek, Kim Tosi, Anthony M. Griffin, Jay S. Wunder, Peter S. Rose, Peter C. Ferguson

Institution: Mayo Clinic, Rochester, MN and Division of Orthopaedic Surgery, Department of Surgery, University of Toronto, Toronto, ON, Canada. University Musculoskeletal Oncology Unit, Mount Sinai Hospital

Introduction: The sacroiliac joint is the only mechanical connection between the axial skeleton and lower extremities. Following iliosacral resection, there is debate on whether reconstruction of the joint is necessary to restore functional stability. Reconstructions are challenging due to the combination of a segmental bony defect and the complex biomechanics of the sacrum which needs to resist compression and rotation. As such reconstructions are associated with a high rate of complications. There is currently a paucity of data comparing the outcomes of patients undergoing reconstruction for an iliosacral resection and those who are not reconstructed.

Purpose: The purpose of the current study was to (1) evaluate the functional outcomes of patients undergoing iliosacral reconstruction with a comparison of patients who were reconstructed and those who were not reconstructed (2) evaluate complications between patients undergoing reconstruction and those who were not reconstructed

Methods: Sixty (25 females, 35 males; mean age 39±18 years) patients who underwent an en-bloc iliosacral resection between 1990 and 2017 were reviewed. The resections were performed for 54 (90%) primary malignant tumors, most commonly chondrosarcoma (n=23, 38%). The mean follow-up for surviving patients was 9 (range 2-19) years**.**

Results: Twenty-seven (45%) patients underwent sacropelvic reconstruction, while 33 (55%) patients had no formal reconstruction, such that iliosacral gap was allowed to close with weightbearing leading to an arthrodesis or pseudarthrosis When comparing patients, there was no difference in the utilization of chemotherapy (p=1.0) or radiotherapy (p=0.29) between the two groups.

Patients with NO reconstruction had a larger tumor (11±5 vs. 8±4 cm, p<0.01), shorter surgical times (663±195 vs. 1,323±380 minutes, p<0.01), and required less blood units (8±7 vs. 14±11 units, p<0.01), and were more likely to have microscopically positive resection margins (n=12, 36% vs n=1, 4%; p<0.01).

The 5-year disease specific survival was 74%. Patients with NO reconstruction had improved 5-year survival (85% vs. 58%, p=0.01). Disease recurrence occurred in 17 (28%) patients including metastatic disease (n=10, 17%), local recurrence and metastatic disease (n=5, 8%) and local recurrence alone (n=2, 3%). Patients who were reconstructed were more likely to develop metastatic disease (HR 3.93, p=0.02) but not local recurrence (HR 3.06, p=0.18).

Complications occurred in 47 (78%) patients, most commonly a wound complication (n=31, 52%). There was no difference in the incidence of complications between patients who did or did not have a reconstruction (n=24, 89% vs. n=23, 70%; p=0.11); however, patients undergoing a reconstruction were more likely to have a deep infection (HR 4.71, p<0.01). No patients in the NO reconstruction group needed to be reconstructed later; however, 9 (33%) patients who underwent reconstruction had a hardware failure and 5 of these patients required a subsequent revision procedure or hardware removal.

Postoperatively 55 (92%) patients were ambulatory, with no difference in the proportion of ambulatory patients (n=24, 89% vs. n=31, 94%; p=0.64) or the use of single arm/no gait aid (n=15, 56% vs. n=24, 73%; p=0.18) between patients who did or did not have a reconstruction. There was also no difference in the mean MSTS93 score between patients who did or did not have a reconstruction (59±21 vs. 68±23%, p=0.16).

Conclusion: Reconstruction of the SI joint following iliosacral resection is a demanding procedure. The results of the current study demonstrate that reconstruction is associated with longer operative times, more units of blood transfused and a higher risk of postoperative infection, but without any improvement in functional outcomes when compared to patients who did not have the SI joint reconstructed.

Table 1: Patients Undergoing Iliosacral Resection and Reconstruction

Patient Factors	All Patients (n=60)	SI Joint Reconstruction (n=27)	No SI Joint Reconstruction (n=33)	P Value
Males	35 (58%)	15 (56%)	20 (61%)	0.79
Females	25 (42%)	12 (44%)	13 (39%)	
Mean Patient Age	39±18 Years	43±19 Years	37±17 Years	0.18
Use of Radiotherapy	22 (37%)	12 (44%)	10 (30%)	0.29
Use of Chemotherapy	30 (50%)	13 (48%)	17 (52%)	1.0
Tumor Size	10±5 cm	8±4 cm	11±5 cm	<0.01

Table 2: Postoperative Outcomes Following Iliosacral Resection and Reconstruction

	All Patients (n=60)	SI Joint Reconstruction (n=27)	No SI Joint Reconstruction (n=33)	P Value
Surgical Time	942±435 minutes	1,324±381 minutes	664±195 minutes	<0.01
Units of RBC Transfused	11±10 Units	14±11 Units	8±7 Units	<0.01
Packs of Platelets Transfused	4±4 Packs	3±3 Packs	6±5 Packs	0.01
Positive Surgical Margin	13 (22%)	1 (4%)	12 (36%)	<0.01
Postoperative Complications	47 (78%)	23 (70%)	24 (89%)	0.11
Deep Infection	17 (28%)	13 (48%)	4 (12%)	<0.01
Wound Complication	31 (52%)	12 (44%)	19 (58%)	0.43
Hardware Failure	9 (15%)	0 (0%)	9 (33%)	<0.01
Functional Outcomes				
Ambulatory	55 (92%)	24 (89%)	31 (94%)	0.64
Single Arm Gait Aid	39 (65%)	15 (56%)	24 (73%)	0.18
MSTS93 Score	63±22%	68±23%	59±21	0.16