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CORR Insights

CORR Insights®: What are the Conditional Survival and Functional Outcomes After Surgical Treatment of 115 Patients with Sacral Chordoma?

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Where Are We Now?

The surgical management of sacral chordoma has evolved to more-aggressive resections, which seek to assure negative margins, since high local recurrence rates were reported with less-aggressive, subtotal resections. Locally recurrent or neglected tumors have proved to be nearly impossible to eradicate, and they lead to painfully slow deaths accompanied by loss of bowel, bladder, and sexual function. Over time, this emboldened surgeons to venture more ablative operations, which on the one hand improved local control, but on the other hand, altered the functions most of us take for granted.

Local control has traditionally been used as the primary outcome measure in studies of sacral chordoma. However, the associated loss of sacral nerve root function, which accompanies mid-to-high sacrectomy has long been subject of study including in vivo quantitative physiologic studies, surgeon-reported functional outcomes and, more recently, patient-reported outcomes [5–7, 10–12].

Prior work supports wide resection as a means to decrease local recurrence and it also documents the negative affect of mid to high sacrectomy on function [4, 10]. More recently, some centers have reported effective local control of sacral chordomas using high-dose proton or carbon-ion-based radiation without surgery [2, 8, 9]. The impact of high-dose radiation on the function of sacral nerve roots has not been well documented.

Ji and colleagues report on one institution's experience with sacral chordoma, emphasizing the oncologic and functional outcomes after operative management. The data present another clear indication that appropriate oncologic margins at the index operation offer the best chance of local control. They also shed light on how the risk of local failure changed over time, with most local recurrences occurring 3 to 4 years after surgery. The relative risk of local failure began to decrease 5 years after surgery.

This CORR Insights® *is a commentary on the article* "What Are the Conditional Survival and Functional Outcomes After Surgical Treatment of 115 Patients With Sacral Chordoma?" *by Ji and colleagues available at:* DOI: 10.1007/s11999-016-4773-8.

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Additionally, they include functional outcomes, using a modification of a previously reported measure [1], which they use to demonstrate a direct relationship between function (pain, bladder, and bowel) and the level of sacral nerve root resected with the tumor.

Local control and functional outcomes appear to be at odds with one another, leaving clinicians and patients with difficult choices between better oncologic outcomes versus pain, and loss of bowel, bladder, and sexual function. This has stimulated the search for other seemingly less-ablative treatment modalities such as high-dose radiation therapy and targeted systemic therapy.

Where Do We Need To Go?

Our goal should be to provide local control while avoiding pain, disability and loss of bowel, bladder and sexual function. Currently, there is a growing body of work that supports the use of high-dose radiation in cases where the morbidity of surgery is unsafe given the patient's medical condition or unacceptable to the patient [3, 8, 9]. However, we do not know with certainty which tumors are best suited for definitive radiation. It is becoming clearer that definitive radiation works better on smaller tumors such as one might find in the lower sacrum. However, low sacrectomies are associated with the least functional loss and they are less technically challenging for the surgeon than high sacrectomies. High sacrectomies usually are performed on larger tumors, and the morbidity of such procedures is well known. Yet these large tumors are the least well controlled with radiation alone. Furthermore, one assumes that patients treated with radiation will have better functional outcomes when compared to surgery, but to my knowledge this comparison has not been studied.

How Do We Get There?

The majority of patients with sacral chordoma still are treated with an operation, and the use of radiation remains controversial. For that reason, I believe many experts have been reluctant to randomize their patients in a controlled study. Another reason that a randomized study is less attractive is that these tumors are rare, and the primary outcome (local recurrence) takes years to occur, making these studies difficult to conduct, and very expensive.

However, there are alternatives to randomized trials that are worth considering here. Collecting baseline patient-reported outcomes as part of longitudinally maintained institutional registries could help shed some light on the impact of treatment on quality of life in patients treated operatively, with definitive radiation or a combination of the two. There are no studies I know of that compare functional outcomes, whether patient-reported or surgeon-reported, to pretreatment values. This would be relatively easy to do and would help shine a light on the impact of treatment. Reanalysis of patients treated with radiation alone will also help us understand whether definitive radiation provides durable local control and which patients are the best candidates for radiation alone. Until we have more data, the surgical management of sacral chordoma likely will remain the standard of care.

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