Low Sacral Resection Of Sacrococcygeal Chordoma Via Posterior Approach – Good Post-Operative Neurological Outcome With Bilateral Preservation Of S3 Nerve Roots

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Citation

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Abstract

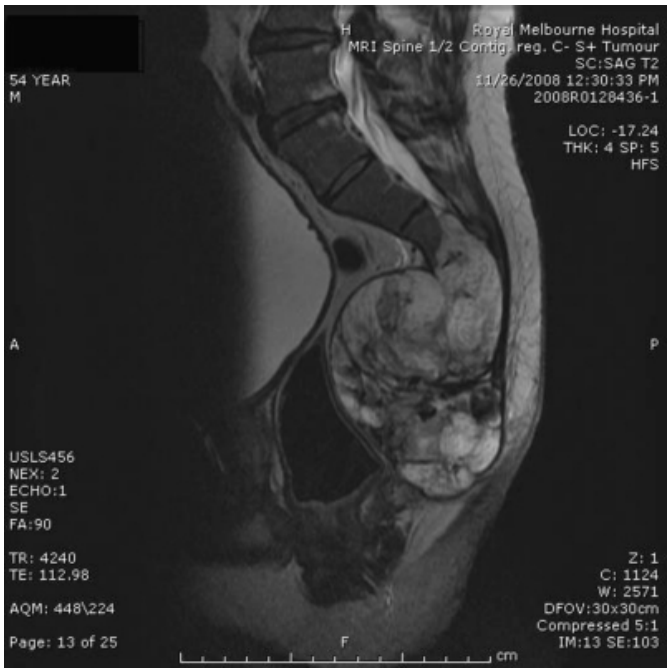
We report a 54-year-old man who underwent excision of sacrococcygeal chordoma via a posterior approach, ideal for low sacral lesions as preservation of pelvic integrity can be maintained. This case emphasises the importance of preserving sacral nerve roots S3 and above if normal post-operative sphincter function is to be maintained.

CASE

A 54-year-old man was referred to our institution by his general practitioner with a CT scan showing a ~10cm diameter sacrococcygeal mass. The patient reported progressive, intermittent back pain with no sciatica for over one year. Plain X-rays revealed no abnormality. Additional symptoms included subjective perianal sensory loss and increasing constipation over the preceding two weeks. Examination revealed a palpable right-sided parasacral mass, reduced perianal sensation but intact lower limb and sphincter reflexes. Lumbosacral spinal CT and MRI demonstrated a large midline circumscribed sacrococcygeal mass (7.7x10x12.7cm) with bilateral S3-S5 nerve root obliteration. (Figure 1)

Figure 1

FIGURE 1 caption: MR lumbosacral spine (Sagittal T2 weighted image) shows a large, septated, hyperintense low sacral lesion

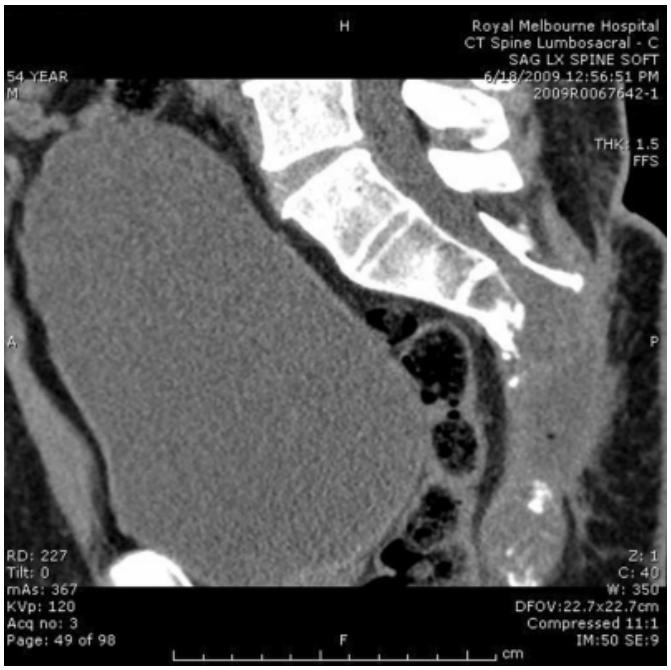


Three months after histological diagnosis of chordoma was procured after CT-guided biopsy, a low dorsosacral lesional resection was performed. A posterior U-shaped flap with wide exposure and surgical margin was employed, in order to avoid wound complications inherent with a midline or transverse incision. (1) Partial sacrectomy and bilateral sacrifice of the S4 and S5 nerve roots enabled a complete

macroscopic resection. Due to the tumour's impressive vascularity and intra-operative hypotension, six units of packed red blood cells were administered intra-operatively; platelet transfusion and fresh frozen plasma were given for mild coagulopathy. The patient recovered well post-operatively, mobilising independently with no new deficits and alleviation of constipation, and was discharged on the sixth post-operative day. Three months post-discharge, the patient remained neurologically intact, and a check CT (Figure 2) revealed sacral resection below S3, with a well circumscribed caudal component containing small fragments of bone, likely to be representative of residual tumour.

Figure 2

FIGURE 2 caption: CT lumbosacral spine (Sagittal – soft tissue) demonstrates excision of the sacrum below S3 with a more caudal component possibly representing residual tumour



The patient has since been referred for a Radiation Oncology regarding the suitability for radiotherapy.

DISCUSSION

Chordoma is an uncommon embryonic notochordal tumour, with peak incidence in the fourth decade of life. These tumours tend to be slow growing, but can be extremely destructive because of their propensity to invade locally and recur. Sacral lesions account for approximately one-third of all chordomas; other common sites of occurrence include the skull base and lumbar spine. Patients usually present with vague, indolent symptomatology, often leading to a delay in diagnosis. Following tumour resection, recurrence occurs either as a result of metastasis or tumour seeding along the surgical pathway.

Sacrococcygeal chordomas are difficult to detect on plain radiography, as exemplified in this case. CT demonstrates bony invasion well, whilst MR best delineates cord/cauda equina compression and identification of local recurrence. Imaging should extend to include the coccyx – many imaging protocols descend only to S2. Chordoma on T1-weighted images are either iso- or slightly hypointense, with vivid gadolinium enhancement. T2-weighted images show high signal with intralesional septations.

Obtaining wide surgical margins is the most important predictor of survival and local recurrence. In one series (median follow-up ~7.8 years), all patients with a wide margin survived. There was a statistically significant improvement in survival in this group versus those with less radical resections. 17 of 21 patients who had a wide excisional margin underwent a combined anteroposterior approach, rather than posterior approach alone. However, many of the patients in the series had high sacral tumours mandating radical hemisacrectomy or sacrectomy for complete excision. Five (74%) and ten year (52%) survival rates compared favourably with established figures. (2)

Structural bone allograft reconstruction with spinal instrumentation fixation is recommended for chordomas requiring hemisacrectomy or total sacrectomy, in which continuity of the pelvic girdle becomes disrupted. A combined anteroposterior approach is mandatory for those chordomas requiring total sacrectomy for complete excision. (3) Pelvic stability is not affected in low sacral resections, as the sacroiliac joints are preserved, and a posterior approach is preferred in these instances where a complete macroscopic excision is feasible, especially in terms of preserving post-operative sphincter function. (1)

Functional post-operative outcomes depend on tumour location, level of surgical resection and remaining sacral roots. Only if both S3 nerve roots are preserved will bowel and bladder function remain intact, as confirmed in our reported case. No sphincter control remains if only S1 nerve roots are preserved. (4)

Radiotherapy in sacrococcygeal chordoma management remains controversial. Radiotherapy indications would include surgically inaccessible lesions, unclear surgical margins, local recurrence or incomplete resection, as evident

in the reported case. Targeting early radiotherapy in a patient with positive surgical margins appears to be the most appropriate use of this modality. (4)

CONCLUSION

Sacrococcygeal chordoma is a rare primitive notochordal tumour, with a proclivity to local recurrence and metastasis. Imaging should extend to the coccyx for early diagnosis and more thorough delineation of the tumour. Complete surgical resection with clear margins portends better recurrence-free and survival rates and radiotherapy should be considered early if there is residual tumour. This case highlights the importance of accounting for conservation of pelvic stability when planning operative management for sacrococcygeal chordoma, and that the posterior approach is ideal for dorsosacral lesions. This case also validates the significance of preserving sacral nerve roots S3 and above at surgery, which should be rigourously pursued where possible, because this results in superior functional outcomes in terms of sphincter control.

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