Expert's Comment concerning Grand Rounds case entitled “Aggressive vertebral hemangioma of the thoracic spine without typical radiological appearance” (Lei Dang, Chen Liu, Shao Min Yang, Liang Jiang, Zhong Jun Liu, Xiao Guang Liu, Hui Shu Yuan, Feng Wei, Miao Yu)

Daryl R. Fourney

Accepted: 18 May 2012 / Published online: 26 June 2012
© Springer-Verlag 2012

Introduction

Although symptomatic aggressive vertebral hemangiomas are relatively rare, it is not unusual to encounter a case every few years in a tertiary spine practice. There are very few spinal lesions that have such a broad array of treatment options (observation, radiation therapy, radiosurgery, embolization, alcohol injection, vertebroplasty, kyphoplasty, laminectomy, intralesional resection, total en bloc spondylectomy and combinations of these treatments) with essentially no consensus in the literature regarding which is most appropriate and in which clinical circumstances.

D. R. Fourney (✉)
Division of Neurosurgery, Royal University Hospital,
University of Saskatchewan, 103 Hospital Drive,
Saskatoon, SK S7N 0W8, Canada
e-mail: daryl.fourney@usask.ca

Although these lesions appear extremely hostile on imaging, it is important to remember that the histology is benign. This patho-radiologic contradiction may explain much of the variation in treatment.

The authors describe a case of a 41-year old physician who presented with back pain and left thoracic radiculopathy due to aggressive vertebral hemangioma at T5 [1]. Although there was spinal cord compression, the patient had no weakness or numbness in her lower extremities. I want to congratulate the authors for successfully alleviating the symptoms with surgery. There was no recurrence 12 months after radiation therapy.

Diagnosis

CT and MRI features of aggressive spinal hemangiomas (osteolysis, vertebral body collapse, epidural extension, etc.) mimic those of primary and secondary malignancy [2]. I agree that it is essential to rule out metastasis. The patient had a PET-CT, but if this is unavailable, another option is bone scan and CT of the chest, abdomen and pelvis. Laboratory investigations for suspicious osteolytic lesions should include complete blood count, calcium, erythrocyte sedimentation rate, C-reactive protein, protein electrophoresis and liver enzymes. A thorough history and physical examination including a complete review of systems may help to elucidate the etiology of “unknown primary” (e.g., hemoptysis, melena, breast mass, etc.). Depending on the clinical circumstances, ancillary investigations (e.g., mammography) may be indicated.

Knowing the histology of spinal tumors is critical in defining the goals of treatment and determining the most

appropriate therapeutic approach [3]. While the importance of diagnosis should not be understated, it may not be possible in the very rare circumstance of rapid and severe neurologic decline. Unfortunately, biopsy of aggressive hemangioma often reveals only blood and necrotic debris with no clear pathologic findings. Although the patient had radiologic evidence of spinal cord compression, there was no neurologic emergency, and therefore the authors very appropriately performed a second CT-guided biopsy to firmly establish the diagnosis.

If repeated biopsies and a systemic evaluation as outlined above are negative, I agree that it is reasonable to treat the patient on the basis of “suspected” vertebral hemangioma. It is important to remember that angiography is useful both as a diagnostic and a therapeutic tool [2].

Treatment

The authors outline a useful treatment protocol, listing options described in the peer-reviewed literature as well as their suggested approach. They correctly point out that because vertebral hemangiomas are pathologically benign, aggressive surgery should not be advocated simply on the basis of canal compromise. I agree that the management for this condition should be largely symptoms-based [4].

Percutaneous vertebroplasty and radiation therapy are not recommended in patients with neurologic symptoms associated with high-grade spinal cord compression. Intraoperative vertebroplasty after laminectomy to achieve direct visualization appears to be a much safer option in this circumstance. However, I have only done it when the posterior elements of the spine are not involved. Multimodality spinal cord monitoring including somatosensory and motor evoked potentials are highly recommended. If epidural compression by the soft tissue component remains after vertebroplasty, in my experience it can be coagulated down with the bipolar electrocautery. We perform preoperative embolization for both open surgical cases and for percutaneous vertebral augmentation [5].

Many very experienced spine surgeons are uncomfortable with the notion of laminectomy, because of the historic inappropriate use of this technique to treat metastatic disease. However, I agree with the authors that aggressive vertebral hemangioma is biologically distinct and therefore the treatment should be distinct [6].

The first major difference is that hemangioma bone has tremendous capacity to heal after radiation therapy. In the absence of significant mechanical pain, percutaneous vertebral augmentation may not be necessary. If radiosurgery is performed, the bone may have less healing potential, and vertebroplasty or kyphoplasty may be necessary.

Advocates of corpectomy rightly point out that laminectomy is not appropriate to decompress ventral spinal cord compression. But this too is based on experience with metastatic disease. In vertebral hemangioma, the soft tissue component may regress after open vertebroplasty, and much of the remaining epidural disease can be coagulated. Serious bleeding can be encountered with corpectomy, despite preoperative embolization. I agree that corpectomy would be most indicated in patients with significant and progressive myelopathy.

Although en bloc spondylectomy with wide or negative margins is aggressive, satisfactory results have been described, and therefore it should not have been excluded from the options in the proposed treatment protocol. It may be most appropriate in the setting of complete circumferential involvement of the anterior and posterior columns of the spine [7]. After transarterial embolization, an en bloc approach offers the potential to optimally devascularize the lesion prior to excision.

The authors suggest that en bloc spondylectomy may be advocated by some if repeated biopsy is inconclusive, in order to avoid the mistake of an intralésional approach for a primary malignant tumor. However, I think it would be foolhardy to subject someone to such a highly morbid procedure without a firm histologic diagnosis [8].

Conclusion

The authors describe not only excellent results with a challenging case, but provide a thorough review with several insightful comments. I fully endorse the symptom-based treatment algorithm they describe. I hope that in the future, surgeons can coordinate multicenter studies to better elucidate the optimal management of these relatively rare lesions.

Acknowledgments No funds were received for the preparation of this manuscript.

Conflict of interest None.

References

1. Dang L, Liu C, Yang SM, Jiang L, Liu ZJ, Liu XG, Yuan HS, Wei F, Yu M (2012) Aggressive vertebral hemangioma of the thoracic spine without typical radiological appearance. *Eur Spine J*. doi:10.1007/s00586-012-2349-1
2. Alexander J, Meir A, Vrodo N, Yau YH (2010) Vertebral hemangioma: an important differential in the evaluation of locally aggressive spinal lesions. *Spine (Phila Pa 1976)* 35:E917–E920
3. Paton GR, Frangou E, Fourny DR (2011) Contemporary treatment strategy for spinal metastasis: the “LMNOP” system. *Can J Neurol Sci* 38:396–403

4. Bandiera S, Gasbarrini A, De Iure F, Cappuccio M, Picci P, Boriani S (2002) Symptomatic vertebral hemangioma: the treatment of 23 cases and a review of the literature. *Chir Organi Mov* 87:1–15
5. Hurley MC, Gross BA, Surdell D et al (2008) Preoperative Onyx embolization of aggressive vertebral hemangiomas. *AJNR Am J Neuroradiol* 29:1095–1097
6. Acosta FL Jr, Sanai N, Chi JH et al (2008) Comprehensive management of symptomatic and aggressive vertebral hemangiomas. *Neurosurg Clin N Am* 19:17–29
7. Acosta FL Jr, Sanai N, Cloyd J, Deviren V, Chou D, Ames CP (2011) Treatment of Enneking stage 3 aggressive vertebral hemangiomas with intralesional spondylectomy: report of 10 cases and review of the literature. *J Spinal Disord Tech* 24:268–275
8. Yamazaki T, McLoughlin GS, Patel S, Rhines LD, Fournay DR (2009) Feasibility and safety of en bloc resection for primary spine tumors: a systematic review by the Spine Oncology Study Group. *Spine (Phila Pa 1976)*, 34:S31–S8