

## Expert's Comment concerning Grand Rounds case entitled “Diagnosis and treatment of a C2-osteoblastoma encompassing the vertebral artery” (by Stavros I. Stavridis, Andreas Pingel, Klaus John Schnake and Frank Kandziora)

Osmar J. S. Moraes

Received: 22 October 2013  
© Springer-Verlag Berlin Heidelberg 2013



I have very much enjoyed reading this scientific communication [1]. That is a very well studied and descriptive case that brings an excellent example of an academic medical management in an oncological case, offering a comprehensive summary of the topic as well.

One remarkable point in this discussion is the fact that, even though the first radiological exams could not achieve a clear diagnostic, the symptoms were wisely valued, leading to a new set of radiological screening that still showed no clear pathognomonic alteration, just a non-specific edema right sided of the C2 vertebral body in the MRI. The suspicion of an undiagnosed pathology was only confirmed when the CT was performed, determining afterwards the need of both exams due to their complementarity on such complex cases [2].

The most clarifying exam was the CT, which revealed that the tumor was situated in the lamina and the transverse

process of the C2. The mass displayed bubble-type calcifications and was almost completely surrounded by a foam-like zone. The adjacent bone appeared to be sclerotic, while there were no visible fresh fracture lines. The main images showed clear limits of the lesion, strongly suggesting an osteoblastoma that allowed the authors to withdraw the obligation of the biopsy, avoiding additional morbidity [3]. At this point, the angiotomography was crucial and very elucidating to build a surgical planning. That exam showed the osteolytic formation with the sclerotic periphery and the central ossification caused a narrowing of the right C2 transverse foramen, with displacement but no infiltration or stenosis of the right vertebral artery. The information supplied by this exam was crucial to decide about embolization [4, 5].

Another solid point regarding the management of this case was the clear structured strategic planning. As the CT image was so suggestive of osteoblastoma, the biopsy was avoided. I am sure that the option of any ablation procedure was excluded due to the proximity of the vertebral artery [6–8]. The surgical resection was planned to be intra-lesional, which in this case was a very smart decision as the attempt of a marginal resection, usually indicated for this pathology, could harm a noble anatomic structure [9]. This tumor was classified as a benign lesion, locally aggressive, the treatment of which is ideally performed by a marginal resection. However, in this case, the total macroscopic intra-lesional resection is acceptable and also a good option to avoid noble structures.

As part of this well-designed surgical planning is also the use of a precise ultrasonic scalpel. This is a very useful tool that helps the surgeon to perform a better and safer dissection around the osteotomy [10].

The use of intra-operative CT scans crowns the high level of professionalism printed in this case management.

---

O. J. S. Moraes (✉)  
Neurosurgery Department, Santa Marcelina's University  
Hospital-Medical School, R. Maestro Cardim, 591. 11 Floor,  
Sao Paulo, SP 0541-300, Brazil  
e-mail: osmarmoraes@gmail.com; osmar@coluna.med.br

With this “checking tool”, the main goal of the surgical treatment, total resection, is highly optimized [11].

Is there anything to be done differently? As it was said before, probably not, mainly because an excellent result like that can never be refuted [12, 13]. To exercise our mental skills, one could say: Since the tumor was completely removed by posterior approach, could it be fused also by the posterior approach? The answer is yes because biomechanically speaking the result would probably be the same when inserting a posterior graft between C2 and C3 laminae with some wiring or combined with a lateral mass plate—fixing only one level just like in the presented situation [14–16]. That would offer the same stability shown in the case without the morbidity of an additional high anterior cervical approach [17]. This is obviously only an option if the total resection can be obtained with certainty from posterior procedure [18]. In that case, it could be confirmed using intra-operative CT scans.

A second question could be raised: Shouldn't we always perform biopsy before surgery? This is another beauty of this well-conducted case. For every rule, one has to accept that there is an exception like the one described [19].

It is my belief that the use of good quality radiological exams can fulfill a criterion for that particular histopathology. It is true that there should be always an attempt to achieve diagnostics by biopsy before surgery. In this case, the differential diagnosis with osteosarcoma and osteoid osteoma is quite unlikely.

Bottom line is that even though osteoblastoma is not so extremely rare, it is very uncommon. One could ask why the editors would choose the one of the most common benign primary osseous spine tumor for discussion in a grand round. My answer is quite easy: It was an outstanding demonstration on how a detailed pre-operative planning strategy can reach an optimized result just by exhausting the possibilities of good care before the surgery [20].

After all, Noah built the Ark before the Diluvium.

## References

1. Stavridis SI, Pingel A, Schnake KJ, Kandziora F (2013) Diagnosis and treatment of a C2-osteoblastoma encompassing the vertebral artery. *Eur Spine J*. doi:10.1007/s00586-013-2875-5
2. LaBan MM, Riutta JC (2003) “Occult” roentgenographic osteoblastoma of the cervical spine. *Am J Phys Med Rehabil* 82(10):820–823
3. Ozkal E, Erongun U, Cakir B, Acar O, Uygun A, Bitik M (1996) CT and MR imaging of vertebral osteoblastoma. A report of two cases. *Clin Imaging* 20(1):37–41
4. Trübenbach J, Nägele T, Bauer T, Ernemann U (2006) Preoperative embolization of cervical spine osteoblastomas: report of three cases. *AJNR Am J Neuroradiol* 27(9):1910–1912
5. Zambelli PY, Lechevallier J, Bracq H, Carlizo H (1994) Osteoid osteoma or osteoblastoma of the cervical spine in relation to the vertebral artery. *J Pediatr Orthop* 14(6):788–792
6. Rybak LD, Gangi A, Buy X, La Rocca Vieira R, Wittig J (2010) Thermal ablation of spinal osteoid osteomas close to neural elements: technical considerations. *AJR Am J Roentgenol* 195(4):W293–W298. doi:10.2214/AJR.10.4192
7. Rosenthal DI, Springfield DS, Gebhardt MC, Rosenberg AE, Mankin HJ (1995) Osteoid osteoma: percutaneous radiofrequency ablation. *Radiology* 197(2):451–454
8. Liu C, Liu XG, Zhu B, Yuan HS, Han SB, Ma YQ (2011) CT-guided percutaneous radiofrequency ablation of spinal osteoid osteoma. *Chin Med J (Engl)* 124(23):4083–4085
9. Boriani S, Capanna R, Donati D, Levine A, Picci P, Savini R (1992) Osteoblastoma of the spine. *Clin Orthop Relat Res* 278:37–45
10. Al-Mahfoudh R, Qattan E, Ellenbogen JR, Wilby M, Barrett C, Pigott T (2013) Applications of the ultrasonic bone cutter in spinal surgery—our preliminary experience. *Br J Neurosurg*. doi:10.3109/02688697.2013.812182
11. Gasiński P, Zieliński P, Harat M, Furtak J, Rakowska J, Paczkowski D (2012) Application of intraoperative computed tomography in a neurosurgical operating theatre. *Neurol Neurochir Pol* 46(6):536–541
12. Denaro V, Denaro L, Papalia R, Marinozzi A, Di Martino A (2007) Surgical management of cervical spine osteoblastomas. *Clin Orthop Relat Res* 455:190–195
13. Schaffer V, Wegener B, Dürr HR (2010) Classical surgical resection of osteoid osteoma of the cervical spine. *Acta Chir Belg* 110(6):603–606
14. Wang D, Tang T, Huang S, Yang H, Zhu Q, Oyang J (1999) Biomechanical evaluation of five fixation techniques for the lower cervical spine. *Zhonghua Wai Ke Za Zhi* 37(5):301–303 (in Chinese)
15. Mihara H, Cheng BC, David SM, Ohnari K, Zdeblick TA (2001) Biomechanical comparison of posterior cervical fixation. *Spine (Phila Pa 1976)* 26(15):1662–1667
16. Lopes Júnior E, De Arruda JA, Melo CV (1999) Fixation of cervical spine with interspinous wiring and autologous bone grafting. *Arq Neuropsiquiatr* 57(1):68–73 (in Portuguese)
17. Cooper PR (1993) Posterior stabilization of the cervical spine. *Clin Neurosurg* 40:286–320
18. Gill K, Paschal S, Corin J, Ashman R, Bucholz RW (1988) Posterior plating of the cervical spine. A biomechanical comparison of different posterior fusion techniques. *Spine (Phila Pa 1976)* 13(7):813–816
19. Marchesi DG, Boos N, Aebi M (1993) Surgical treatment of tumors of the cervical spine and first two thoracic vertebrae. *J Spinal Disord* 6(6):489–496
20. Amendola L, Cappuccio M, Boriani L, Gasbarrini A (2013) Endoscopic excision of C2 Osteoid Osteoma: a technical case report. *Eur Spine J* 22(Suppl 3):S357–S362