

INTRODUCTION OGS is a rare malignant bone tumor. Wide margins resection associated with chemotherapy is the gold standard of treatment. Advances in radiotherapy have provided another treatment consideration to complement surgery. **METHODS** We retrospectively reviewed a series of 23 patients affected by primary OGS of the spine treated at tertiary referral hospital between 2009 and 2020. The clinical, pathologic, and radiographic data were reviewed in all cases. All cases were classified according to Enneking and Weinstein, Boriani, Biagini (WBB) classifications. **RESULTS** 23 patients were initially included in the present study. Three patients were excluded because they were initially surgically treated at other institutions or because affected by low grade OGS. The median follow-up was 15.7 months (range 4- 95) or until death. 13 of 20 patients were dead at final follow up (65%). The disease specific one- and five- year survival rate for the global cohort were 68.4% and 36.8% respectively. 4 over 20 patients received high energy particles as adjuvant therapy after aggressive, extracapsular intralesional excision. In this group of patients, the disease specific survival rate was 100% at one year and 100% at five years. 4 over 20 patients received adjuvant photons therapy. In this group of patients, the survival rate was 25% at one year and 0% at five years. 8 patients underwent a planned en-bloc spondylectomy. 5 of the 8 patients who underwent en-bloc resection had a negative margin. The median survival for patient who underwent planned en-bloc resection was 26.4 months. The median overall survival for the 5 patients who underwent en-bloc resection with confirmed negative margins was 15.8 months. The one-year survival was 80% while the five-year survival was 40%. 12 patients underwent planned intralesional resections. The median survival for all patient who underwent planned intralesional gross total resection was 14.3 months. 4 out of this 12 patients received adjuvant high energy particle therapy, the median disease-specific survival for this subgroup of patients was 25.7 months. The other 8 patients had a median disease-specific overall survival of 8.6 months. Patients treated with intralesional gross total resection and particle therapy had a significant higher disease-specific survival ($p = 0.029$).

DISCUSSION From a technical point of view an en-bloc excision in terms of margin-free spondylectomy can be performed when the tumor extends to only one pedicle, i.e., it is centrally located and confined only to zone 4–8 or 5–9 according to the WBB system. However, a considerable number of cases of OGS of the spine falls in the group of planned inappropriate resection due to the extension of the tumor. This is the group of patients which mostly benefits of the advent of high energy particle radiotherapy. The concept of “separation surgery” is changing the surgical paradigms also for the treatment of primary tumors of the spine.