Metastatic Meningioma: Case Report
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Background
Tumours of the skull base are complicated to manage due to their relationship with major blood vessels and lower cranial nerves. Treatment of benign tumours can result in significant morbidity with regards to swallowing, airway protection and vocalisation and so decision to treat must involve multidisciplinary discussion and support both pre and post treatment.

Patient history
66-year-old woman who presented initially with profound hearing loss, tinnitus and balance disturbance. MRI revealed a large skull base tumour that was presumed to be a schwannoma and treated with radiation therapy. She remained asymptomatic for 5 years until she presented with severe headache.

History continued
The tumour was debulked in Belgium in 2017 due to worsening headaches and enlargement of the tumour. The tumour was found to be vascular which complicated dissection, subtotal resection was performed due to capsule adherence to CNVII-XI and major vessels. Histology at this time confirmed meningioma.

Post-operatively she received intensive rehabilitation for swallowing difficulties. The intratympanic portion of tumour continued to grow and erode through the external auditory canal, this was associated with severe intractable pain and so a palliative debulking was offered.

Pre-operative angiography showed a predominant blood supply from the ascending pharyngeal artery which was embolised. Within 12 hours of embolisation she lost her facial nerve function.

At time of blind sac closure and palliative debulking (48 hours post-embolisation) the tumour was very soft allowing more extensive resection than expected with minimal blood loss. The facial nerve was preserved but did not regain function.

Post operatively she had further deterioration of swallowing and new onset of right vocal cord palsy. She declined percutaneous gastrostomy, vocalisation improved with restyley injection to her vocal fold.

Discussion:
Tumours that involve the jugular foramen and cerebellopontine angle are rare, the majority are glomus tumours (~60%), schwannomas (~17%) or meningiomas (~10%), rarer tumours include endolymphatic sac tumours, chordomas, chondrosarcoma or metastatic disease. While each has characteristic radiological findings it can be difficult to distinguish between schwannoma and meningioma.

Treatment of benign tumours is a treatment of choice, radical surgical removal is complex as it is difficult to access and puts the lower cranial nerves at risk, radiation is a reasonable option for slowing schwannoma growth1,2. The risks associated with tumour progression must be balanced against the risk of treatment.

The high grade histology and eventual metastatic spread of this meningioma was unexpected. While initially reported as WHO (World Health Organisation) grade I (~70% of cases) it was subsequently diagnosed as WHO grade III (~3% of cases) when further tissue was available3.

Metastatic spread is rare in meningiomas with an incidence of 0.1% - 0.71%4. WHO grade III lesions show a 8.6% incidence of metastatic spread and are associated with a poor outcome, while WHO grade I show no chance of spread by definition5.

Investigation for metastases at the time of the WHO grade III diagnosis may have allowed earlier diagnosis but would have been unlikely to change the outcome.

This case highlighted a number of important aspects of managing a difficult case. Support from the multidisciplinary team was crucial due to the significant risk of morbidity with treatment options. At presentation the tumour was not resectable without causing significant morbidity, the tumour was presumed to be a schwannoma and so radiation therapy was given to stop tumour growth. Further treatment, debulking of the intracranial portion and finally palliative debulking of the intratemporal portion were performed when the benefits outweighed the risks of surgery, these were extensively discussed with the patient. Pre-operative embolisation was a useful adjunct to decrease blood loss, soften the tumour and decrease operative time4, however it did not prevent worsening of lower cranial nerve function.

References

Images:
1. MRI of a skull base tumour presumed to be an intracranial meningioma invading the jugular foramen
2. In 2015 with intratumoral haemorrhage managed conservatively
3. Subtotal resection of intracranial portion. Post operative bulbar symptoms
4. Cervical and rib metastatic disease
5. Enlarging tumour. Erosion of tumour through ear canal. Severe pain. Blind sac closure and palliative resection after embolisation
6. Temporal bone and erosion of external auditory canal
7. Enlarging tumour pre (left) and post (right) embolisation of ascending pharyngeal artery and post pedicel artery branches.
8. Image 6: MRI (left) and CT (right) in 2019 showing extensive destruction of temporal bone and erosion into external auditory canal

Time:
2010 (UK) Presented with balance difficulties, tinnitus and profound right sided hearing loss
2015 (UK) Intratumoral haemorrhage managed conservatively
2017 (Belgium) Subtotal resection of intracranial portion. Post operative bulbar symptoms
2019 (NZ) Cervical and rib metastatic disease
2020 (NZ) RIP

2011 (UK) Completed 50 Gy IMRT for presumed jugular foramen schwannoma
2016 (NZ) Worsening headache. Enlarging tumour
2019 (NZ) Erosion of tumour through ear canal.

6 months postoperatively intercostal and cervical metastases were found, survival from this diagnosis was 6 months.