Craniofacial Resection of Transdural Tumours

Tumours do not confine themselves to the anatomical site from where they originate. They invade adjacent structures. Because of their close proximity, tumours of the sinuses, orbit, nasopharynx and infratemporal fossa can invade the dura and the brain.

Invasion of the dura and/or brain (transdural invasion) is a known negative prognostic factor for patients undergoing craniofacial resection for cranial base malignancy. It doesn’t mean they are not resectable or incurable.

In a recent study, Feiz-Erfan et al from M.D. Anderson Cancer Center (Prognostic significance of transdural invasion of cranial base malignancies in patients undergoing craniofacial resection. Neurosurgery 61:1178–1185, 2007) has shown that the survival and progression-free survival in highly selected patients with transdural invasion of cranial base malignancy is similar to what has been historically reported for patients without such invasion. The most important variables positively affecting overall survival and progression-free survival seem to be the ability to achieve a microscopically negative resection margins followed by absence of brain invasion. Even though monobloc resection is preferable, performing this resection in a piecemeal fashion does not seem to affect survival outcomes.

Long-term survival is achievable when patients with malignant tumour infiltrating the dura (transdural disease) are properly selected and aggressively managed with multimodal therapy. The most critical selection criterion is the ability to achieve a gross total resection, especially one with microscopically negative surgical margins. Resection of the tumour either in a monobloc or piecemeal fashion does not seem to be pertinent.

Transdural invasion of malignant cranial base tumours should not rule out attempts at curative resection as part of a multimodality treatment plan. But when a patient presents with a high-grade pathology and with brain invasion, we have to be more cautious before recommending craniofacial resection.
43 years old male underwent radiotherapy and then total maxillectomy for squamous cell carcinoma of left maxilla. Tumour recurred and he was on palliative chemotherapy elsewhere. He was unable to eat because of severe pain. He lost the vision in his left eye. Tumour was found ulcerating through the skin over the zygoma.

MRI shows tumour infiltrating the orbit (yellow arrow).

MRI shows the tumour infiltrating the pterygoid muscles in the infratemporal fossa (blue arrow).

Green arrow points at the dura that is thickened due to tumour infiltration.
Dural defect was closed with fascia lata and then covered with vascularised pericranial flap (yellow arrow). Defect was reconstructed with an anterolateral thigh microvascular flap with three skin pads (one to reconstruct the lateral nasal wall (blue arrow), second to reconstruct the defect in the palate (green arrow) and the third to reconstruct the skin cover (white arrow)). Picture on the right side shows the bone grafts (arrow) used to give the facial contour.
Post-op CT shows the site of resection reconstructed with anterolateral thigh microvascular flap (yellow arrow). No evidence of recurrence.

3D reconstruction of CT shows the defect in the skull base (yellow arrows) involving most of the anterior and middle cranial fossae.

3D reconstruction of CT shows the extent of resection.

5 years post surgery
52 years old male patient presented with the h/o nasal obstruction and bleeding from the nose. MRI showed an extensive tumour involving both ethmoids, nasal cavity and extending into the anterior cranial fossa involving the frontal lobe of brain. Tumour was found to be neuroendocrine carcinoma. He underwent craniofacial resection and post-op radiotherapy.