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Transnasal endoscopic resection of the intraconal metastases from renal cell carcinoma: A case report

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Abstract

Renal cell carcinoma (RCC) is the most common malignancy to cause metastasis to sinonasal cavity. These metastasis can occasional cause invasion into the orbit. Isolated intraconal intraorbital metastasis from RCC is very rare. We hereby describe a case of 72year old female, who underwent right nephrectomy for RCC, 8 yrs back, and now presenting with a space occupying lesion in the right intraorbital compartment with no involvement of the paranasal sinuses. En bloc resection of the tumor was achieved via transnasal endoscopic approach. This is a rare case where minimally invasive surgery was done for metastatic lesion, with minimal postoperative morbidity.

Keywords: Transnasal endoscopic approach; Intraconal intraorbital; Metastasis

Case Report

Patient is a 72 year old female, with a past history of right nephrectomy for RCC 8 yrs back, presented with painless proptosis in right eye with double vision since 3 months. On examination, patient had mild proptosis, but had complete lid closure, globe was pushed inferolaterally and had mild congestion around the medial canthus, Vision in both eyes was normal, but orbital movements in right eye were grossly restricted in medial direction.

Opthalmological evaluation was suggestive of space occupying lesion in the right intraconal space with restricted ocular mobility in the medial direction. Vision was normal and fundoscopy revealed no abnormality.

Magnetic resonance imaging of paranasal sinuses showed a mass 2.1*1.8*2.6cm in right orbit, in the medial quadrant space, mostly in the intraconal space, with venous pooling, indenting the eyeball and stretching the optic nerve. There was no extension into the orbital apex region or the cavernous sinus region.

A PETCT scan done to rule out distant metastasis, showed an FDG avid mass in the medial aspect of right orbit, displacing the eyeball, with intraconal extension. No obvious erosion of the orbital walls or extension into the nasal cavity. No evidence of distant metastasis to lung, liver or bone. There was no uptake in the abdomen or pelvis.

In the tumor board meeting, it was decided to remove the mass via Transnasal endoscopic approach. Intraoperative, complete ethmoidectomy was done and bony lamina papyracea was found to be intact. The periorbita was also found to be intact. Two separate horizontal incisions were given on the periorbita. Superior incision was made at the level of the axilla of the middle turbinate and the lower incision was made at the level just above the widely opened antrostomy. The whole periorbita was removed. The mass was seen bulging into the nasal cavity. Using ball point probe, the medial rectus muscle was separated from the mass and was delivered en bloc. It was well circumscribed, smooth and globular with no adhesions to the other intra ocular muscle or fat.

In immediate postoperative period, patient had ecchymosis of the lower eyelid with painless restriction in the medial gaze. Patient was discharged on post op day 3 after a nasal pack removal and a check nasal endoscopy. On post op day 7, patient was recalled for a review from ophthalmologist, who suggested no active management for the adduction defect and to follow up after 3 months.

Histopathological report confirmed the mass to be a metastasis from clear cell renal cell carcinoma. In view of the above, a review from the uro-oncology department was taken. They advised no active management as there was complete resection of the mass, and to follow up after 3 months. A check nasal endoscopy revealed well healed nasal cavity, with no evidence of prolapsed orbital fat, no evidence of adhesions, and patent airway.

Patient was reviewed after 3 months. MRI showed minimal post op fibrosis, complete ethmoidectomy status. No evidence of SOL in the intraorbital / extraorbital compartment.

Ophthalmologic evaluation showed minimal restriction of the globe in medial and lateral gaze, which could be due to

postoperative fibrosis. As there were no major symptoms related to diplopia and vision, no active treatment was advised. Patient was advised to be on regular follow up. Last telephonic follow up revealed patient was loco regionally controlled and disease free for 6 years. Vision in both eyes and orbital movement bilaterally were normal.

Discussion

Orbital tumors encompass a broad spectrum of benign and malignant lesions intrinsic to the orbit, like cavernous hemoangiomas, schwannomas, hemangiopericytomas, and tumors arising from the skin, sinuses, nose, paranasal sinuses, cranial bones and secondary orbital tumors. Cavernous hemangiomas are the most common intraorbital primary tumors in adults. [1]. Broadly the approaches to the orbital tumors could be classified as external, endoscopic microsurgical, endoscopic endonasal, combined and transorbital endoscopic approaches (Table 1).

Table 1: Advantages and disadvantages of different kinds of approaches.

Approach	Advantages	Disadvantages
Lateral rhinotomy	Excellent exposure of the lateral orbital compartment, both intra and extraconal.	Cosmetic scar and leads to ocular muscle manipulation.
Transconjunctival approach	For small basal and medial intra and extraconal tumors.	Limited view and hence not suitable for large lesions.
Supraorbital approach	Large lesions situated superior to the optic nerve.	Cosmetic scar and leads to ocular muscle manipulation.
Pterional approach	Excellent exposure of the posterior part orbit, superior orbital fissure, anterior temporal fossa and upper part of the medial orbit	Extensive manipulation may lead to injury of the frontal lobe, intaorbital bleed, cerebral edema and seizure.
Endonasal microsurgical approach	For resection of small intra or extraconal tumors.	Provides very limited view compared with the narrowness and deepness of the surgical field.
Endonasal endoscopic approach	Intra or extraconal lesion located medial to the optic nerve and in the inferior part. Avoids intraocular muscle detachment. Short procedure Minimal tissue manipulation. Decreases recovery time Best cosmetic outcome, as no scar.	Not suitable for lateral and superior compartment tumors.
Combined open and endoscopic approach	Improved visualisation of the medially based lesion.	Cosmetic scar
Transorbital endoscopic approach	For selected tumors involving the anterior orbital roof, lateral and posterior orbital compartment. No cosmetic scar.	Risk of damage to intraorbital structures due to increased intraorbital pressure.

Crucial elements involved in surgical planning are; the exact location of the tumor and its relation with critical structures, the size of the lesion, the type of the tumor and the experience of the operating surgeon. (1) With the evolution of better endoscopic endonasal instruments and techniques, the medial orbital compartment becomes easily accessible. While the management of the extraconal lesions appears relatively easy, intraconal pathology requires more technical expertise and a steep learning curve [1,2]. A safe resection of the orbital tumor through an endonasal endoscopic approach requires respect of few anatomic principles [3].

- It is critical to avoid crossing the optic nerve
- Entry through the lamina propria should be below the level of the ethmoidal foramina, which allows sparing of the ethmoidal arteries and reduces the risk of retrobulbar haemorrhage.
- Dissection should occur by incising the periorbita in between the medial and inferior rectus muscle to preserve the function and the tumor being dissected off the periorbital fat.
- It is ideal for benign tumors which are less vascular, as space constrain may hamper hemostasis.

For the above reasons, cavernous hemangioma is the most ideal tumor to be resected endoscopically [4].

Our patient presented with a well circumscribed lesion in the medial intraconal compartment which on final histopathological examination was confirmed as a metastasis of renal cell carcinoma (RCC). Around 25 to 33% of the patients with RCC presents as metastasis at the first diagnosis [5]. Most common location of metastatic sites are lungs (75%), regional lymph nodes (65%), bone and liver (both 40%). Cases with metastatic locations in head neck are around 15 % [6]. From 1 to 13% of orbital tumors are metastases [7] Studies conducted in different countries demonstrates that 3 to 10% of the orbital metastases are derived from kidney [8-11]. The development of RCC metastasis to the sinonasal cavity and orbit is classically explained by the passage of the malignant cells through the venous shunt created by Batsons plexus, which bypasses pulmonary capillary filtration [12] RCC would be previously diagnosed in 55% cases, The delay between the diagnosis of the

primary and the diagnosis of the metastasis in the sinonasal cavity ranged from 1 month to 21 years (mean: 7.35 ± 5.8 yr). Some 39.3% of recurrences were diagnosed more than 10 years after the diagnosis of the primary [13] It is not yet established whether RCC metastasis to the sinonasal cavity and orbit should be classified as bony or soft tissue metastasis [13]. Other rare sites of metastasis, reported in head neck are, thyroid, tongue, pharyngeal wall and pyriform sinus [13]. Guidelines and recommendations state that the choice of treatment strategies will depend on the history of the primary RCC as well as the number of metastases and their location [14-16]. Metastasectomy is indicated for single and resectable RCC metastases in selected patients [16,17]. A retrospective review by Bastier et al found that surgical treatment was associated with a significantly higher percentage of complete local responses than were other strategies. No significant difference in local response was found between patients who underwent surgery alone and those who underwent surgery and received radiotherapy. No difference in overall survival curves was found between local treatment and no local treatment or between systemic treatment and no systemic treatment. However, overall survival was significantly better for patients who had isolated vs. multiple metastases. There was no difference in overall survival between patients whose sinonasal metastasis represented the first presentation of RCC and those who had already been diagnosed with RCC [13].

Conclusion

RCC metastasis to intraconal compartment of the orbit is a very rare phenomenon. Endoscopic endonasal resection of such a metastatic lesion is an effective treatment for isolated metastasis, with no significant postoperative morbidity. Only well encapsulated, well defined lesions are amenable for resection with a minimally invasive approach. Capsular rupture would lead to microscopic residual disease which would entail orbital exenteration for R0 resection

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