

Case Report

Sinonasal Bone Destruction caused by Frontal Meningioma Invasion related with Respiratory Tract Infection Incident: A Case Report

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ABSTRACT

Meningioma is uncommonly found in extracranial. Extracranial meningioma can be extension from primary intracranial tumors that accompany osteolytic changes in the skull or causes bone destruction. In this article, we report about intracranial meningioma in the frontal region that extend to the sinonasal bone causes bone destruction and being predisposing factor for respiratory tract infection. A 47-years old female brought to the emergency department due to dyspnea and fever since a week ago and there was found a lump in the frontal region. During the surgical procedure, there was invasion of tumor and caused sinonasal bone destruction. The endotracheal tube (ETT) can be seen from the surgical field. In this case the patient was threatened pneumonia infection, it can be related as complication of sinonasal bone destruction that caused by invasion of meningioma to extracranial manifestation. The clinical important that must be informed to the patient the possibility of recurrent respiratory tract infection incidents.

Keywords : Case report, Frontal Tumor, Meningioma

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INTRODUCTION

Meningioma is one of the major subgroups of intracranial neoplasms that account for around 36% of all primary brain tumors (Iwami et al. 2015). Meningioma is uncommonly found in extracranial. Extracranial meningioma can be extension from primary intracranial tumors that accompany osteolytic changes in the skull or causes bone destruction (Jang et al. 2014). In this article, we report about intracranial meningioma in

the frontal region that extend to the sinonasal bone causes bone destruction and being predisposing factor for respiratory tract infection.

CASE REPORT

A 47-years old female brought to the emergency department due to dyspnea and fever since a week ago. Based on the physical examination on the primary and secondary survey, the patients was initially diagnosed as pneumonia and suspected due to COVID-19. On the secondary survey examination, there was found a lump in the frontal region. The lump is fixed, solid; approximately Ø 5 cm x 5 cm.

After stabilization the primary condition, the patient was planned to examination for frontal meningioma. Based on the Head CT scan, there was showed a large soft-tissue mass in the frontal meningioma with extracranial extension into areas that included the sinus frontal, the anterior wall of the ethmoid sinus, sphenoid sinus and nasal cavity (Figure 1).

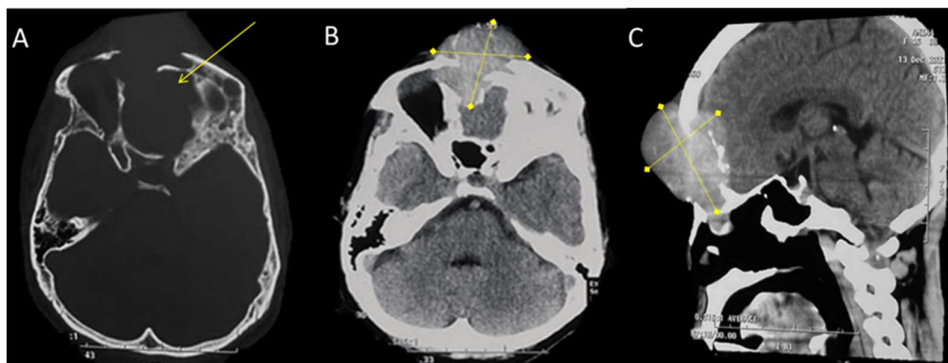


Figure 1. Head computed tomography (CT), A. Bone window axial view showed sinonasal bone destruction, B. Brain window axial view invasion of the tumor to the sinonasal, C. Brain window sagittal view showed large tumor come from intracranial.

After the patient in stable condition, surgical plan for treating the tumor was planned. A frontal craniotomy with coronal incision was performed with the aim of removing the tumor. Subsequent to opening a skin flap, the tumor was found to invade through the frontal bone and extend to ethmoid and sphenoid sinus (Figure 2A-B). The extracranial lesion was resected as widely as possible and the erosion of the frontal bone was extended by resection into the normal bones, to remove a section 6x6 cm in diameter. The frontal base was opened to the ethmoid sinus and sphenoid sinus for drainage to the nasal cavity. During the surgical procedure, the invasion caused endotracheal tube (ETT) can be seen (Figure 2C). The defect was closed using skin, lipid and muscle combination. And the frontal skull base were reconstructed with a titanium mesh (Figure 2D)

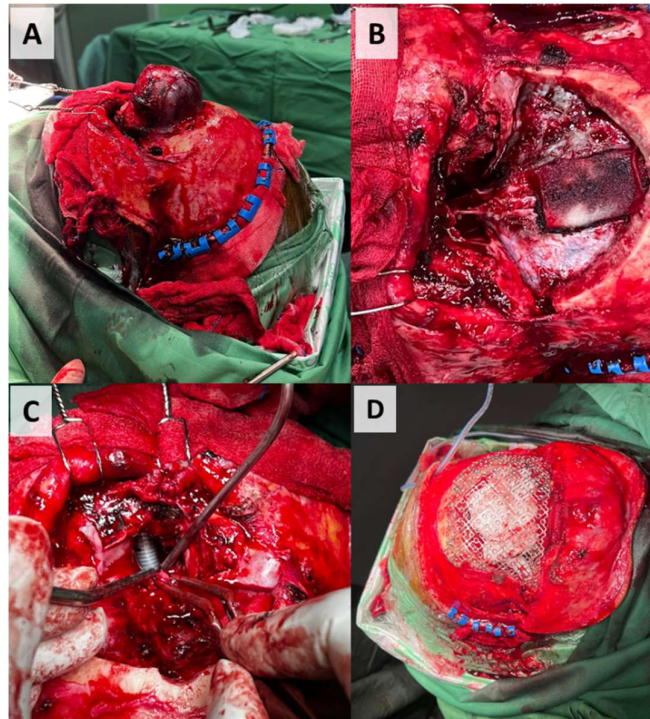


Figure 2. Surgical finding, A. Extracranial mass in the frontal region, B. Frontal sinus destruction, C. Endotracheal tube (ETT) appearance during surgery, D. Reconstruction of cranial bone using titanium mesh.

DISCUSSION

Extracranial meningioma is uncommon type of meningioma and there is only less than 2 % of all meningioma arise at a primary ectopic site (primary extracranial meningioma) (Aiyer et al. 2013; Friedman et al. 1990). Extracranial meningioma is commonly found in orbital cavity area and mostly associated with intracranial mass as primary tumor (Farr et al. 1973). Extracranial meningioma have also been rarely found in the ear, nose, paranasal sinuses, parotid, neck, pharynx, mandible, and skin (Atherino, Garcia, and Lopes 1985; Lopez, Silvers, and Helwig 1974; Papini et al. 1988).

In this case report we found meningioma that has extension manifestation extracranial into sinonasal and causes sinonasal bone destruction. In some literature, extracranial meningioma can be extension from primary intracranial tumors that accompany osteolytic changes in the skull or causes bone destruction (Jang et al. 2014). The mechanism of sinonasal tract as extension of meningioma has not been cleared in the literature (Khan et al. 2017; Onyszczuk and Drozdowska 2019; Thompson and Gyure 2000). However, there are two possible mechanisms that might causes meningiomas spreading into the sinonasal tract in this case. The first mechanism is meningiomas is not originated

intracranially, but it may have originated in an extracranial site and spreaded secondarily into the cranial cavity. The second mechanism is the meningioma may have originated inside the cranial cavity and ruptured through the foramina and crevices, resulting in extracranial (sinonasal tract) augmentations as the primary expression of the intracranial tumor (Onyszczuk and Drozdowska 2019).

The extension of meningioma into sinonasal cavity can affect the others disease. Physiologically, nasal cavity is the portals route for entry of external air into the lungs that has hair (vibrissae) for trapping unwanted air-borne contaminants (Koparal et al. 2021). It is provided by the epithelium pseudostratified columnar type with intercalated ciliated and goblet cells and contribute to the mucociliary function. The normal mucociliary clearance of the nasal and paranasal sinus mucosa is important for preventing infection by clearing bacterial pathogens. The sinonasal bone destruction causes physiological change of sinonasal cavity especially for the primary defence mechanism of the respiratory system (Rawlings, Higgins, and Han 2013). Ineffective ciliary activity can lead to acute or chronic infections in the upper and lower respiratory tract (John C. Smulian Sonja A. Rasmussen MD 2020).

CONCLUSION

In this case the patient was threated pneumonia infection, it can be related as complication of sinonasal bone destruction that caused by invasion of meningioma to extracranial manifestation. The clinical important that must be informed to the patient the possibility of recurrent respiratory tract infection incidents.

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