Bilateral bony bar bridging of the sigmoid sulcus: a case report

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Abstract

The crest, plate and bars like bony projections may be present on sigmoid sulcus. The bony connection between petrous temporal and occipital bone may divide the jugular foramen. A skull with bilateral curved bony plate connecting the inner margin of groove for sigmoid sinus and petrous temporal was observed during routine osteology classes. The shape, size and location of both the bars were almost identical. These bony bars were connecting the posterior margin of petrous temporal and postero-lateral part of sigmoid sulcus. Structurally, they resembled as a part of ring. The location of the bar was more lateral on left side as compared to right side. Some bony erosion was also seen in the floor of sigmoid sulcus. Bilateral ossification and formation of bar at sigmoid sulcus is associated with venous sinus anomalies, dural ossification and intracranial calcifications.

Key words: petrous temporal, occipital bone, sigmoid sinus, bony plate

Introduction

Sigmoid sulcus lodges the sigmoid sinus. Sigmoid sulcus begins as a downward continuation of the transverse sulcus at the posterior mastoid angle of parietal bone, and ends at the end of jugular foramen. Sigmoid sinus continues as internal jugular vein in the jugular foramen. The sulcus is related anteriorly to the tympanic antrum. In the upper part of sulcus, mastoid foramen opens near its posterior margin. The sigmoid sinus is a venous sinus ensheathed with endosteal layer and meningeal layer of duramater. The meningeal layer of duramater covering venous sinus is rare to ossify. The bony projections in form of crest, plate and bar are common between the margins of petrous temporal and occipital bone at the end of sigmoid sulcus. These bony connections are related with the division of jugular foramen. This unusual ossification explains the process of bone formation inside the cranial cavity and is important to neurologists. The possible factors leading to this anomaly has been discussed in the present case.

Case report

During routine examination of bones from bone processing lab of King George's Medical University, Lucknow, Uttar Pradesh, India, a skull was having bilateral bony bars bridging sigmoid sulcus. The age and sex of skull was not known. The bony bars were present at right and left grooves for sigmoid sinus. Both bars were almost identical in shape, size and location. These bony bars were connecting the posterior margin of petrous temporal and postero-lateral part of sigmoid sulcus. Structurally, they resembled as a part of ring. The location of the bar was more postero-lateral on left side as compared to right side. Some bony erosion was also seen in the floor of sigmoid sulcus. The connecting ends of these bars were spreading at the margin of petrous temporal and sigmoid sulcus (Fig.1).

Discussion

The abnormal bony connection between occipital and temporal bone has been reported several times. But identical bilateral bony bar at sigmoid sulcus in a skull is an unusual finding. Osseous projections were observed on the anterior lip of the sigmoid sulcus in a study conducted on 318 dry unsexed adult human skulls belonging to the Indian race. For convenience of description, this lip was divided into a longer lateral part, a shorter medial part and a junctional angular part having bony attributes characterized into three types, crests (42.9%), plates (22.3%) and bridges (13.5%). The bridges were subtyped into incomplete (11.8%) and
complete (1.7%). Crests and plates were present anywhere along this lip, while bridges were confined to the angle and in relation to anterior lip. The present case has ossified curve plate at the posterior lip of sigmoid sulcus on the lateral part.

The bridging is established by the contact of intra jugular process of temporal bone with the bony process of occipital bone either from just above the hypoglossal canal (Type-I) or from posterior to the hypoglossal canal (Type-II). In case of type I bridging, the anteromedial compartment transmits the glossoharyngeal nerve while the posterolateral compartment gives passage to the vagus nerve, the accessory nerve and the internal jugular vein. In case of type II bridging, the anteromedial compartment contains the glossoharyngeal, vagus and accessory nerves while the posterolateral compartment transmits the internal jugular vein. In our case, the bony connection was not dividing the jugular foramen and was far away from jugular process of temporal bone. The bony plates in the present case seem to cover only sigmoid sinus. Bony erosion at floor of both sigmoid sulcus was also seen near bony plates. Osseous bar may be attributed to ossification or calcification of dura overlying the sigmoid sinus. Various physiologic and dystrophic intracranial calcifications are described in literature. Five cadavers were studied, which showed retinacular bands attached to the bony projections at sigmoid sulcus blending with duramater over the foramen magnum. It is postulated that these projections are caused by the traction of fibrous dural bands.

It is also important to be aware of other calcifications which may be associated with vascular malformation and aneurysm. The patient with cavernous angiomas often has stippled calcification in vessel wall or adjacent brain parenchyma. Early dural calcification is a common manifestation of basal cell nevus syndrome. They involve falx cerebri, diaphragma sellae and tentorium cerebelli. These are also common sites of physiologic calcifications. Although the precise origin of the dural cells is obscure, duramater develops from perineural tube mesenchymal tissue in which some neural crest cells invade. Since neural crest cells are responsible for the origin of neuro- cranial bones, some of the cells in the duramater have potential to transform into osteoblast

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**Fig. 1:** Showing bilateral bony bar at sigmoid sulcus (arrow)
like cells⁴. The process of formation of bilateral bony plates is important for neurologists while dealing with sigmoid sinus pathologies.

**Conclusion**

Proper anatomical knowledge of bony bars bridging sigmoid sulcus is necessary for the accurate diagnosis and treatment of neurovascular pathologies involving this area.

**References**


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