Journal of Morphological Sciences
J Morphol Sci
Brazilian Society of Anatomy

Case Report
J Morphol Sci 2021;38:425-427

Bilateral Postglenoid Foramen: a Rare Case and Literature Review

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Disclose and conflicts of interest: none to be declared by all authors

ABSTRACT

Introduction: the postglenoid foramen is a foramen located in the temporal bone of humans in a position anterior to the external acoustic meatus. During embryonic development it serves as secondary drainage of the petrosquamous sinus. It usually loses its light before birth, but it can persist into adulthood as a drainage pathway from the transverse sinus.

Case report: During a routine study of the lower surface of the skull base, a case of persistence of the bilateral postglenoid foramen in an adult skull was observed, without identification of sex or age, the right side being larger than the left side.

Conclusion: Knowledge of this foramen is of paramount importance to health professionals, especially when performing surgical procedures in the tympanic cavity, which can lead to iatrogenic bleeding, as well as prevent misdiagnosis and misinterpretation through imaging exams.

Keywords: Postglenoid foramen; Petrosquamosal sinus; Anatomic Variation; Diagnostic Imaging; Temporal Bone.

Introduction

The postglenoid foramen (PGF) is a rare foramen in human adults, usually appearing in the temporal bone, in a position anterior to the external acoustic meatus, in the fusion line between the squamous and tympanic parts. Also called retroarticular foramen or spurious jugular foramen, it appears during the embryonic life of placental mammals in order to drain the petrosquamous sinus.[1-3] This corresponds to the embryological persistence of an emissary vein, which connects the brain venous drainage to the extracranial venous system, in the initial development of all mammalian embryos, through two paths: an anteroinferior, in the retromandibular vein, through the retroarticular foramen and an anteromedial one , in the pterygoid venous plexus, through the foramen ovale.[3,4] Despite having a relevant role in the vast majority of mammals, in humans this venous sinus plays a secondary role throughout embryonic development, and over time its regression occurs. The degree of this regression of the petrosquamous sinus is associated with the increasing dominance of the internal jugular vein over the external jugular vein, which can be determined by the relative development of the brain over the face and the consequent disappearance of the PGF.[2-5]

However, in some rare cases, the petrosquamous sinus persists, so that there is also the persistence of PGF, often becoming the main drainage route of the transverse sinus.[6] This article aimed to report a rare case of persistent postglenoid foramen in a dry human adult skull.

Case report

During a routine study at the Laboratory of Anatomy of the Department of Morphology of the Federal University of Sergipe, a case of persistence of the postglenoid foramen at the base of the zygomatic process of the right temporal bone of na adult dry skull was observed in the lower view of the skull base, without identification of sex or age, superolateral to the mandibular fossa, posteromedial to the articular tubercle and anteromedial to the mastoid process. The anteroposterior and transverse diameter of the right PGF was larger than the left (Table 1), being slightly oval on the right side and rounded on the left (Figure 1).

Table 1. PGF morphometric ratio.

	Morphometry (mm)	
	Dimidium	
	Right	Left
Anteroposterior diameter of the PGF	2.49	0.69
Transverse diameter of the PGF	2.25	0.59
Distance from PGF to median line	60.36	60.86
Distance from PGF to the zygomaticotemporal suture	28.64	28.83
Distance between PGF to the apex of the mastoid process	28.49	28.91
Distance between the PGF and the articular tubercle	15.10	15.02
Distance between the PGF to the postglenoid tubercle	6.47	5.31

DOI: 10.51929/jms.38.73a.2021
ISSN 2177-0298

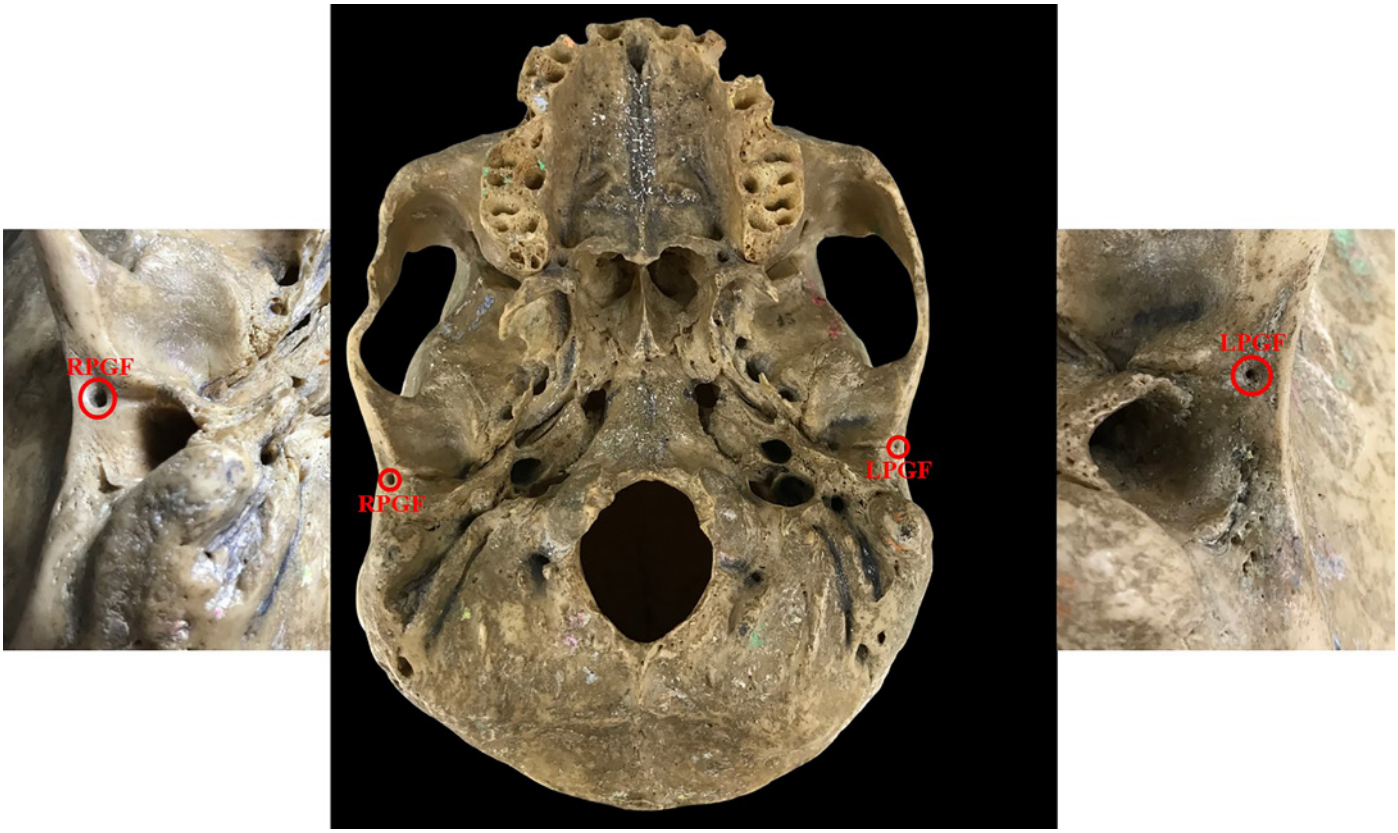

Figure 1. Inferior view of the base of the skull showing the postglenoid foramen.
RPGF - Right posgleoid foramen
LPGF - Left posgleoid foramen

Discussion

Literature on the persistence of the postglenoid foramen is extremely scarce and its incidence varies from 2% to 10%.[3,4,7] Priya, Yasodai,[4] analyzing 100 skulls, identified only one unilateral postglenoid foramen in the mandibular fossa of the left temporal bone (2%). For Wysocki,[3] the postglenoid foramen was found in two of 50 (2%) male skulls and in five of 50 (5%) female skulls examined, always unilaterally. He also differentiated the foramina found in superior and inferior, being the first found near the base of the zygomatic process of the temporal bone and the second found posterior to the mandibular fossa of the temporal bone and anteriorly to the tympanic region,[3,4] which is in agreement with our work, where the postglenoid foramen was situated bilaterally at the base of the zygomatic process.

Due to its low incidence, the presence of PGF (and consequently the rare sinus which it drains) may be unknown or even underestimated in a situation of surgical procedures performed close to the region where it is located. In this sense, some authors warn about the importance of knowing the PGF in surgeries performed in the middle ear, in cochlear implants, which require a mastoidectomy followed by a posterior tympanotomy or through the translabyrinthine route to the posterior cranial fossa, which can cause uncontrollable surgical bleeding or postoperative sigmoid sinus thrombosis.[6,8,9] We report a rare finding of a bilateral postglenoid foramen found at the bases of the zygomatic processes of a dry skull, through which a rare and forgotten emissary vein passes that drains the petrosquamous sinus.

The diagnosis of these two anatomical variations – both FPG and petrosquamous sinus – can be detected by venous angiotomography (CT angiography) or magnetic resonance angiography (MR angiography) in the preoperative period of middle and inner ear surgeries, in order that the surgeon can easily plan the access route to the middle ear cavity, through the mastoid, and avoid accidental opening of the petrosquamous sinus, since venous channels that do not leave a visible groove and run through the temporal bone cannot be seen. [2,8-10]

Conclusion

The PGF is a rare finding in humans. Considering the presence of PGF in ear surgeries is of vital importance not only for anatomists, but also for otolaryngologists and neurosurgeons, due to the extreme care that must be taken during surgical procedures in this region, as the sacrifice of this exit route can lead to to fatal venous ischemic and hemorrhagic consequences.

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Received: September 13, 2021
Accepted: October 10, 2021

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