

Incidence of foramen of Huschke in dry human adult skulls

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ABSTRACT

Aim: The aim of this study was to estimate the incidence of foramen of Huschke in dry human adult skulls. **Materials and Methods:** The study was made on 60 dry human adult skulls that are collected from the Department of Anatomy in Saveetha Dental College and Hospitals, Chennai. The present study is based on direct observation of the dry human adult skulls in the tympanic part of temporal bone for the presence of the foramen. The observation was also made if the foramen is present unilaterally or bilaterally. Estimation of the foramen of Huschke is not been done based on sex difference. **Results:** The observation of 60 dry adult human skulls showed the presence of foramen of Huschke in just 5% of skulls, which obviously shows that the presence of this foramen is very rare. Of 120 temporal bones, only five of these foramens were observed. Of these 60 skulls, two skulls showed the presence of foramen of Huschke bilaterally. One skull showed the presence of foramen of Huschke unilaterally. The presence of foramen of Huschke with sex difference is not estimated. **Conclusion:** A knowledge about foramen of Huschke or foramen tympanicum may be useful in treating patients with TMJ herniation.

KEY WORDS: Foramen of Huschke, Foramen tympanicum, External auditory canal, Temporal bone

INTRODUCTION

Foramen of Huschke which is also known as foramen tympanicum was first described by Emil Huschke who was German anatomist and embryologist in 1889 in the tympanic portion of the temporal bone and may remain throughout life.^[1] The foramen tympanicum is an anatomical variation that is created in the tympanic plate of temporal bone during the 1st year of life. The tympanic plate grows and foramen tympanicum is gradually closed by about the 5th postnatal year. However, due to a defect in normal ossification, foramen tympanicum sporadically remains throughout life.^[2] The persistence in adult subjects is known as an anatomical anomaly, and it may be attributed to affections such as herniations of temporomandibular joint (TMJ), as well as otological problems in the external acoustic canal. This particular anomaly has been an area of interest to several authors who have drawn attention to the fact of this anomaly being a potential route for dissemination of infections

from the external acoustic meatus affecting the TMJ and the parotid gland; tumors originated in the articular fossa which uncommonly reach the external acoustic meatus; cases of spontaneous salivary fistulas in the same acoustic meatus; and complications resulting from TMJ arthroscopy.^[3-6]

MATERIALS AND METHODS

The study was made on 60 human adult skulls that are collected from the Department of Anatomy in Saveetha Dental College and Hospitals, Chennai. The present study is based on direct observation of the dry human adult skulls in the tympanic part of temporal bone for the presence of the foramen.

RESULTS

The observation of 60 adult human skulls showed the presence of foramen of Huschke in just 5% of skulls, which obviously shows that the presence of this foramen is very rare. Of 120 temporal bones, only 5 of these foramens were observed. Of these 60 skulls, two skulls showed the presence of foramen of Huschke

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bilaterally. One skull showed the presence of the foramen of Huschke unilaterally.

DISCUSSION

The foramen tympanicum, also known as the foramen of Huschke, is an anatomic variation in the tympanic portion of the temporal (tympanic) bone. In some cases, the foramen may remain in the adult skull.^[7] Foramen of Huschke or foramen tympanicum is given importance in the literature due to the complications of its presence [Figure 1]. A foramen tympanicum may also facilitate ear injury during TMJ arthroscopy performed with an endoscope of <3 mm in diameter, which may penetrate into the EAC by traversing the persistent foramen. Reported otologic complications are tympanic membrane rupture, dislocation of the incus, injury to the tympanic segment of the facial nerve, labyrinthine disruption, and ear infection.^[8] Other associated pathologies are related to otorrhea without any evident otologic causes. Both salivary-gland fistulas and synovial TMJ fistulas are reported.^[9]

Persistence of foramen of Huschke was found to be 23% in the study conducted by Chauhan and Khanna. Foramen of Huschke was observed in 14 dry human adult crania of a total of 60 crania examined. It was present unilaterally in 10 crania (4 in the right side of temporal bone and 6 on the left side) and was bilateral in four.^[10]

Wang *et al.* have done an osteologic study with 377 skulls and have found the persistence of the foramen of Huschke to be 7.2%. They have found that there was an unilateral foramen in 3.4% of 13 skulls and Henrique had a persistence of 17 in 113 skulls.^[11]

Toyama *et al.* noted unilateral presentation of the foramen of Huschke in most of the patients, but unilateral presence of this foramen was observed in one skull only in our present study and bilateral in 4 crania only.^[12]



Figure 1: Presence of foramen of Huschke in the tympanic part of temporal bone

Srimani *et al.* in 2013 have studied 53 crania and have observed the presence of foramen of Huschke in seven of them. Foramen of Huschke was on the left side in all the seven crania though was unilateral in three only.^[13]

Kanodia *et al.* have done a prospective study on 100 consecutive normal CT scans of posterior fossa and 100 dry adult skulls with no bony abnormality.^[14]

The foramen tympanicum is an incidental finding in most cases and does not need treatment in these cases. However, its presence should be sought if a patient presents with persistent ear discharge.

CONCLUSION

The current study about the incidence of the foramen of Huschke and its results about its presence unilaterally or bilaterally are subjective to variations. A knowledge about foramen of Huschke or foramen tympanicum may be useful in treating patients with TMJ herniation without any injury to the middle and internal ear structures. It may also be useful in treating patients with transient otorrhea. Specialists in ear, TMJ, and adjacent regions should rule out the persistence of the foramen of Huschke, as well as being aware of the significant clinical implications of its presence for the patient.

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