Case Report

An unusual finding of the auriculotemporal nerve: possible risk factor during preauricular skin incisions

Joe Iwanaga1,2,3, Samuel L. Bobek4, Christian Fisahn1,5, Ken Nakamura3, Yoshihiro Miyazono3, R. Shane Tubbs1

1Seattle Science Foundation, Seattle, WA 98122, USA; 2Department of Anatomy, 3Dental and Oral Medical Center, Kurume University School of Medicine, Kurume, Fukuoka 830-0011, Japan; 4Swedish Maxillofacial Surgery, 5Swedish Neuroscience Institute, Swedish Medical Center, Seattle, WA 98122, USA
Correspondence to: Joe Iwanaga. Seattle Science Foundation, 550 17th Ave, James Tower, Suite 600, Seattle, WA 98122, USA.
Email: joei@seattlesciencefoundation.org.

Abstract: The auriculotemporal nerve (ATN) is a branch of the mandibular nerve and has been implicated for some migraines and its role in Frey’s syndrome is well known. An adult cadaver was found to have a duplicated ATN. The anterior trunk ascended as the superficial temporal artery and gave off the branches to the temporomandibular joint, parotid gland, external acoustic meatus and temporal region and communicated with a posterior trunk of the ATN. The posterior trunk ascended via the subcutaneous tissues 1 mm anterior to the auricle and gave off the branches to the anterior auricular region, temporal region and communicated with the anterior trunk. Such a duplicated ATN might be injured with preauricular skin incisions. Knowledge of such an anatomical variation might assist surgeons in iatrogenic injury of the ATN.

Keywords: Auriculotemporal nerve (ATN); infratemporal fossa; Frey’s syndrome; mandibular nerve

Submitted Aug 09, 2016. Accepted for publication Aug 17, 2016.
doi: 10.21037/gs.2016.09.02
View this article at: http://dx.doi.org/10.21037/gs.2016.09.02

Introduction

The auriculotemporal nerve (ATN) is one of the branches of the mandibular division (V3) of the trigeminal nerve. Clinically, branches of the ATN have been implicated as an etiology of some migraines and its role in Frey’s syndrome is well known. An adult cadaver was found to have a duplicated ATN. The anterior trunk ascended as the superficial temporal artery and gave off the branches to the temporomandibular joint, parotid gland, external acoustic meatus and temporal region and communicated with a posterior trunk of the ATN. The posterior trunk ascended via the subcutaneous tissues 1 mm anterior to the auricle and gave off the branches to the anterior auricular region, temporal region and communicated with the anterior trunk. Such a duplicated ATN might be injured with preauricular skin incisions. Knowledge of such an anatomical variation might assist surgeons in iatrogenic injury of the ATN.

Case presentation

During the dissection of a cadaver that was 87-year-old at death, the left ATN was demonstrated (Figure 1) and found to bifurcate into two main trunks (anterior and posterior). This occurred just behind the base of the condylar process where each main trunk emerged from the superficial layer at approximately 10 mm above the middle of the tragus. The anterior trunk ascended in a similar way as the superficial temporal artery and gave off branches to the temporomandibular joint, parotid gland, external acoustic meatus, temporal region and a communicating branch with the posterior trunk of the ATN (Figure 2). The posterior trunk ascended via the subcutaneous layer 1 mm anterior to the auricle and gave rise to branches to the anterior auricular region, temporal region and a communicating branch with the anterior trunk of the ATN. In addition, two main trunks interconnected anterior to the auricle (Figures 1,2). The diameter of the anterior and posterior trunks was 1.35
and 1.73 mm, respectively. Branches to the zygoma were not observed.

Discussion

The ATN is described as giving rise to branches to the temporomandibular joint, parotid gland, external acoustic meatus, anterior auricle, zygoma and superficial temporal region (1,6). Komarnitki (3,4) classified the branches based on the root system and relationships of the ATN and middle meningeal artery. Kwak (5) and Tansatit (7) noted communicating branches between the ATN and facial nerve. The STb of the ATN has been investigated by Andersen (8) who found that the most superficial part of the STb is located 8 and 20 mm anterior to the root of the helix and is found at a depth of 2–10 mm at the middle part of the tragus. In the present case, the posterior trunk ascended 1 mm anterior to the external ear in the subcutaneous tissues. Andersen (8) also mentioned that on 4 of 19 sides (21%), the ATN had only one main branch and that in 11 cases, the nerve was divided into smaller branches while in another four cases, it had a diffuse branching pattern. However, none of these authors mentioned two main trunks of the ATN that bifurcate in the infratemporal fossa. It is very important anatomical variation for clinical consideration. If the patient whose ATN ascends in a similar way as the posterior trunk of the present case or has two main trunks like our case, a preauricular skin incision might easily injure the ATN. Surgeons should be aware of this variation in order to avoid iatrogenic injury of the ATN.

Acknowledgements

The authors wish to thank all those who donate their bodies and tissues for the advancement of education and research.

Footnote

Conflicts of Interest: The authors have no conflicts of interest.
to declare.

References


