The Nerve Supply of the Human Auricle

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Knowledge of the innervation of the outer ear is crucial for surgery in this region. The aim of this study was to describe the system of the auricular nerve supply. On 14 ears of seven cadavers the complete course of the nerve supply was exposed and categorized. A heterogeneous distribution of two cranial branchial nerves and two somatic cervical nerves was found. At the lateral as well as the medial surface the great auricular nerve prevails. No region with triple innervation was found. Clin. Anat. 15:35-37, 2002. © 2002 Wiley-Liss, Inc.

Key words: innervation; external ear; cadaveric study; variation

INTRODUCTION

A detailed knowledge on vascularization and innervation of the outer ear is crucial for reconstructive and plastic surgery in this region. Moreover, the innervation of the auricle is the theoretical basis of different reflex therapies (e.g., ear acupuncture). However, data on the innervation as provided by scientific publications are scarce, incomplete, and inconsistent. The aim of this study is to describe the system of the auricular nerve supply.

MATERIALS AND METHODS

On 14 ears of seven cadavers the complete course of nerve supply was exposed under magnifying glasses. Each branch was defined by identifying its origin. The bodies (both sexes, age between 68 and 84 years) donated to the Institute of Anatomy had been embalmed with a mixture of formaldehyde, chloral hydrate, and sorbitan solution. Ramifications were coated with a water-soluble dye and photographically documented. The results were transferred to a scheme of the external ear and classified.

RESULTS

A heterogeneous distribution of cranial branchial nerves and somatic cervical nerves was found. At the lateral surface the GAN (great auricular nerve) prevails. In 73% of cases the ABVN (auricular branch of vagus nerve) and in 18% the GAN was found on the antihelix solely, and 9% showed a double innervation. The lobule and the antitragus were supplied by the GAN in all cases. The tragus was innervated by GAN in 45% solely, in 9% by the ATN (auriculotemporal nerve), and in all other cases by both of them. The tail of helix and the scapha were always supplied by the GAN, the spine of helix in 91% by the ATN (9% GAN). The ATN was found in 80% at the crus helicis, in 20% the ABVN branched on this part. In 9% the ABVN provided ramification for the crura antihelicales (91% GAN), in 4% of the specimen for the cavity of conchæ, and in 100% for the cymba conchæ. In 35% two nerves were found on the cavity of conchæ (GAN and ABVN). No region with triple innervation was found. For an overview see Table 1 and Figure 1A.

At the medial surface of the auricle the LON (lessor occipital nerve) participated in 55% of the innervation of the upper third (in 37% solely). The GAN participated in 62% (in 27% solely); in 36% double innervation was found. The supply of the middle third was provided in 64% by the GAN (18% solely), in 73% by the ABVN (27% solely), and in 18% by the LON (in no case solely). Double innervation was seen in 55% of the middle third. At the lower third, in 91% of the cases GAN was found (73% solely), and in 27% the ABVN (9% solely). No region with triple innervation was found at the medial surface of the auricle as

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