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Case Report

Rare and Multiple Variation of the Auricula: (Case Report)

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Ear marks and measurements are often used for identification in the absence of valid fingerprints. Auricular variations were identified in a 22-year-old male university student. Both ears were accompanied by absence of tragus, thick crus helicis, prominent antitragus, long incisura intertragica and downward-sloping convex crus antihelicis. He does not have a known disease. Auricular variations are seen 2% in normal people and 98% in genetic diseases.

Keywords: Variation, Auricula, Tragus, Antitragus

INTRODUCTION

The human ear is divided into external, middle and internal parts. Auricle and external acoustic meatus form the external ear which is utilized in the forensic sciences for individual identification and authentication (Purkait and Singh, 2007). The lateral surface of the auricle is irregularly concave, faces slightly forward and displays many eminences and depressions, which can make contactvarious surfaces and can produce a print as a rubber stamp (Meijerman et al., 2004). Ear marks and measurements are often used for identification in the absence of valid fingerprints.

The dimensions of the pinna have been found to vary among different ethnic groups (Kumar and Singla, 2013). Knowledge regarding the normal human ear dimensions and morphological features of various populations can be helpful from anthropological and forensic point of view to provide data procedures for the inclusion and exclusion of persons for identification on the basis of ear variations. External ear as a tool for identification is largely based on the concept that the form of ear features constituting the external ear varies from person to person. In other words, it is to be investigated whether these features can play the same role as the ridge characteristics in fingerprint identification (Purkait and Singh, 2007). The anatomical structure of the external ear is utilized for personal identification of living subjects in relation to criminal activity (Swift and Rutty, 2003).

Normal auricular anatomy has been showed in Figure 1.

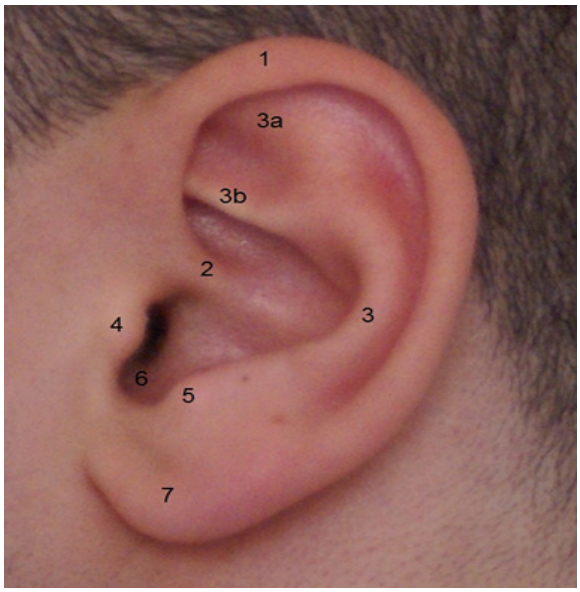

Figure 1. Normal auricular anatomy.
1: Helix, 2: Crus helicis, 3: Antihelix, 3a: Crus superius antihelicis, 3b: Crus inferius antihelicis, 4: Tragus, 5: Antitragus, 6: Incisura intertragica, 7:Lobulus auricularis.

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CASE DEFINIATION

22-year-old male university student. There is no congenital anomaly in his face area. There is no congenital anomaly in other parts of his body and he does not have a known disease. Tragus was not fully formed, absence of tragus was detected. It was merged with crus helicis. Crus helicis was thicker than normal and merged with antihelix. Prominent antitragus was present. Crus inferius antihelicis was downward-sloping. Incisura intertragica was longer than normal. Lobulus auricularis was stuck. Nodosity Darwin's tubercle was present. Auricula was located on vertical axis. (The vertical axis of the normal auricle is tilted posteriorly approximately 20°). The same variation was found in right and left auricula.

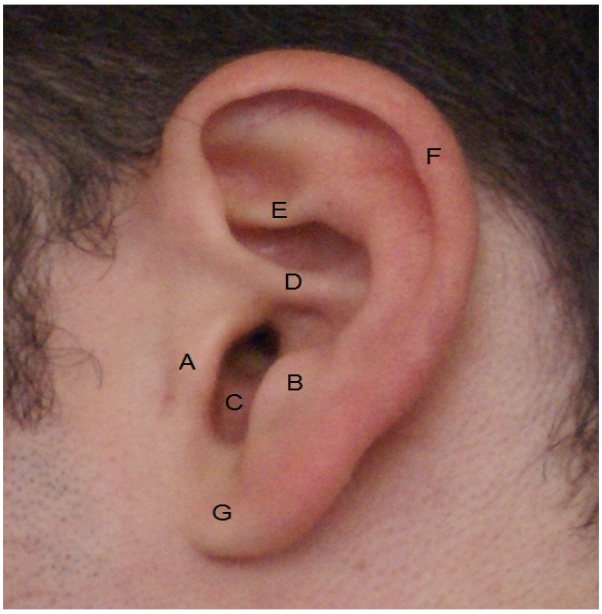

Figure 2. Auricular variations (Left auricula)
A: Absence of tragus, B: Prominent antitragus, C: Long incisura intertragica, D: Thick crus helicis which united with antihelix, E: Concave downward crus inferius antihelicis, F: Nodosity Darwin's Tubercle, G: Adherent lobulus auricularis.

DISCUSSION AND CONCLUSION

Morphological features of external ear like presence or absence of Helix, Tragus, Antitragus, overall shape of the ear, features of lobule etc. 98% of the mentally retarded group showed bilateral differences in morphological features of external ear whereas only 2% of the normal healthy subjects showed bilateral differences. Positive correlation was observed between mental retardation of various etiology and morphological anomalies of the external ear (Pimple et al., 2013). Morphological examination and morpholometric variations of human ears can be used as supportive evidence as having a role in forensic field by the identification of landmarks variations in different ethnic groups (Verma et al., 2016). The knowledge of the ear features whose expressions are variable even in genetically related persons could be useful in establishing personal identity. It was observed that high percentage of differences between males (Verma et al., 2014).

Tragus a small cartilaginous flap in front of the external opening of the ear. The tragus variations described up to now are these: Prominent tragus, small tragus, absence or presence of tragus, large concha completely covered with tragus, accesory tragus, double tragus. As tragus and antitragus variations are common, they can be encountered in autism, growth retardation, fragile x and Down syndrome (Pimple et al., 2013).

Accessory tragus is small nodules present at birth, anterior to the tragus, derived from first branchial arch remnants and often containing central cartilage. Accessory tragus is a fairly common, benign congenital anomaly of the external ear that presents as a small elevation of the skin that is made up of skin, subcutaneous fat, and/or elastic cartilage. Although an accessory tragus is a benign finding, it is important to note that it may appear as part of Goldenhar syndrome (also known as oculo-auriculo-vertebral spectrum), a type of craniofacial microsomia. They are usually just on one side and more commonly appear as a solitary lesion, although there may be multiple. Furthermore, children with external ear anomalies have a slight increased risk of renal anomalies so a thorough history and referral to a nephrologist for a renal ultrasound may be warranted. Accessory tragus is present in males and females equally with a prevalence of approximately 2-6/1000 live births. The formation of an accessory tragus is due to errors during embryogenesis. During the fifth and sixth week of intrauterine life, there are soft tissue swellings on the surface of the embryo called hillocks, which are derived from the first and second branchial arch. These hillocks grow and fuse to become the three parts of the ear: helix, antihelix, and the tragus (http).

Double tragus: There is another variation of tragus and its frequency is unknown.

Darwin's tubercle shape identified are these: Absence, Nodosity, Enlargement, Protrusion and Tubercle (Purkait and Singh, 2007).

Incisura intertragica was longer than normal and 14.32 mm. The mean incisura intertragica length of male university students in which our study has not been published yet, was 8.68±2.16 mm.

Absence of tragus, thick crus helicis, prominent antitragus, long incisura intertragica, downward-sloping convex crus antihelicis and nodosity Darwin's tubercle were together in our case we identified.

The concept that the morphologic features of ear, constituting the external ear varies from person to person. The anatomy of the external ear is unique and morphology of human's external ear can be used as a fingerprint in forensic identification.

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