Otosclerosis is an osseous dyscrasia limited to the human temporal bone (1). It is diagnosed clinically on the basis of otoscopy, audiometry, and tuning fork tests. CT can be used when the diagnosis is in doubt, in some patients with bilateral disease and in those cases with mixed deafness (2). In the majority of cases, the lesion may appear quiescent and limited to the anterior oval window, without stages involvement. However, the process can spread across the stapedial annular ligament and fix the stapes, producing a conductive loss. Alternatively, it can surround the cochleas and parts of the labyrinth causing a sensorineural loss (1). Otosclerosis can be classified as fenestral and cochlear. Fenestral otosclerosis occurs in the region of the fissula antefenestra, anterior to the oval window niche (3). CT can visualize the extend of the pathology involving the oval window, footplate and the round window. When otosclerotic foci affect the cochlear capsule, there is a variable disruption of the density and outline of the capsule (2).

INTRODUCTION

OBJECTIVE

The purpose of this study was to correlate computed tomographic (CT) scans and audiometric findings in those patients with clinical features of otosclerosis.

METHODS

STUDY GROUP

- 20 patients with clinical and audiometric findings of otosclerosis.
- All had mixed deafness.

CONTROL GROUP

- 20 patients presenting unilateral or bilateral tinnitus.
- No clinical evidence of conductive hearing loss

Exclusion criteria:

- History of the acoustic trauma
- Endolymphatic hydrops
- Younger than 18 years old
- Signs of otitis media on the otoscopic examination
- Chronic noise exposure
- Paget's disease, Osteogenesis imperfecta or Syphilis

All of patients were submitted to audiometric analysis and temporal bone CT. The axial and the 20-degree coronal oblique projections were studied and 1 mm thick slices were obtained. Areas of the ear studied were (Figures 2 - 5): FAF (fissula ante fenestra), RW (round window), AC (anterior cochlea), PC (posterior cochlea), A (cochlear apex), SC (semicircular canals). The CT features above were correlated to audiometric findings in both groups. Spearman correlation coefficients were used to determine association between categorical data and independent t-test analysis was performed on hearing thresholds between groups.

RESULTS

20 patients with otosclerosis, all of them with mixed deafness, and 20 patients with tinnitus completed the study. In 19 patients from study group (Figure 2), there was at least one otospongiosis/otosclerosis focus (95% sensitivity). Nine cases, from the study group, showed only foci in the FAF, two cases in the RW, four cases showed involvement of both FAF and RW. CT scan foci were confirmed at surgery if possible. In the study group, four patients presented some foci in the cochlea, in addition to foci in the FAF and RW. In the study group, only one temporal bone CT scan (5%) did not show a radiological feature of disease. In the control group, there were some otosclerotic like foci in four patients.

Figures 3 and 4 show the otosclerosis foci in the oval window (red arrow) and the cochlea (yellow arrow).

CONCLUSION

Temporal bone CT scan, with 1 mm slices, has a high sensitivity in detecting otosclerotic foci in those patients with clinical and audiometric findings of fenestral or cochlear otosclerosis. The focus location (on CT) may predict worse sensorineural hearing loss but has little relationship with other audiometric findings in these patients.

REFERENCES