Chapter 20
A Comprehensive Analysis of Findings on Clinical, Radiological, and Histopathological Correlations in Cholesteatoma

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ABSTRACT

Cholesteatoma, abnormal growths or keratinized tissue in the middle ear, has many symptoms, making diagnosis difficult. This study examined the complex relationship between clinical, radiological (HRCT), and histological findings in cholesteatoma to improve diagnosis and treatment. The respected Krishna Institute of Medical Sciences and Hospital methodically collected data from 100 suitable patients over 18 months (KIMS). The method included clinical exams, otoendoscopy, HRCT scans, and surgery, followed by a thorough tissue sample analysis. This study found a male propensity for cholesteatoma, peaking in the fourth decade. Discomfortable ear discharge and hearing problems dominated the clinical profile. Clinical investigations and otoendoscopy revealed common abnormalities, with attic retraction pockets accounting for 56% of cases. HRCT scans accurately identified ossicular involvement, indicating the stapes suprastructure in 49% of instances. Histopathological investigations also showed atrophy (95%), acanthosis (90%), and basal cell hyperplasia (90%). (identified in 91 percent of cases).

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INTRODUCTION

Cholesteatoma, a term coined by Johannes Müller in 1838, refers to either cystic formations or the presence of keratinizing epithelium within the middle ear cleft. These formations exhibit a distinctive white-yellow appearance due to the accumulation of keratin, reminiscent of cholesterol crystals (Semaan & Megerian, 2006). Despite its name, cholesteatomas do contain traces of cholesterol. The cholesteatoma epithelium also referred to as the cholesteatoma matrix, mirrors the four-layer structure found in thin skin epidermis: basal, squamous, granuloumatous, and stratum corneum (Dornelles et al., 2005).

Histologically, cholesteatomas can manifest various characteristics, including basal layer hyperplasia, atrophy, and the formation of epithelial cones. Atrophy involves the thinning of the cholesteatoma matrix, while basal layer hyperplasia entails an increase in cell numbers (Schraff & Strasnick, 2004), occasionally resulting in invaginations termed epithelial cones. The inflammatory process is often discernible through intense perimatrix permeation by lymphocytes, neutrophils, plasmacytes, and macrophages (Diom et al., 2013).

Cholesteatomas are categorized as acquired or congenital, with acquired cholesteatomas typically arising from conditions like otitis media with effusion (OME) or acute otitis media (AOM). Chronic eustachian tube obstruction or trauma to the temporal bone that leads to the implantation of the epidermis into the middle ear or mastoid can also give rise to acquired cholesteatoma (Nevoux et al., 2010; Aljehani & Alhussini, 2019).

Clinical examination for acquired cholesteatoma involves a thorough inspection of the tympanic membrane, focusing on the pars flaccida and the posterosuperior quadrant of the attic. Notably, the identification of a spherical, white, compressible lesion under the tympanic membrane in the anterosuperior quadrant of the mesotympanum is considered pathognomonic for cholesteatoma (Soldati & Mudry, 2001; Baráth et al., 2010).

In the realm of diagnostics, high-resolution computed tomography (HRCT) has emerged as the gold standard since the early 1980s. Otologists rely on HRCT for surgical planning, aiming to identify anatomical abnormalities and potential complications such as facial nerve dehiscence, mastoid anomalies, and labyrinthine fistulas.

While CT scans exhibit a high negative predictive value in ruling out cholesteatoma in well-aerated tympanomastoid cavities, their efficacy is crucial for determining bone involvement. However, CT scans have limitations in assessing soft tissue alterations, necessitating surgical exploration, especially in cases with severe complications (Olszewska et al., 2004).

The primary objective of surgical intervention in cholesteatoma cases is the complete eradication of the disease, achieving a non-discharging dry ear (considered safe), and maximizing the likelihood of preserving hearing. Surgical exploration plays a pivotal role in establishing a definitive diagnosis, guiding the surgeon in addressing the accurate extent and type of cholesteatoma.

Against this backdrop, our study aims to comprehensively analyze the correlation between clinical findings, preoperative HRCT findings, and intraoperative surgical findings in cholesteatoma cases. By investigating the predictive accuracy of these modalities, our goal is to deepen our understanding of the disease, refine surgical planning, and ultimately enhance patient outcomes. This holistic approach seeks to bridge the gap between clinical assessment, radiological imaging, and histopathological correlations, offering a more nuanced perspective on the intricate nature of cholesteatoma pathology.