

# Cytokeratin expression pattern in acquired cholesteatoma versus meatal skin; an immunochemical study

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## Introduction

Cholesteatoma is a proliferative disease of the middle ear with unclear pathogenesis and bone resorption activity mechanism.<sup>1,2</sup> Cytokeratins represent a well-known epithelial proliferative and differentiation markers.<sup>3</sup> In the current study, we investigated expression of a large set of cytokeratins in cholesteatoma matrix versus deep meatal skin tissues from the same patients.

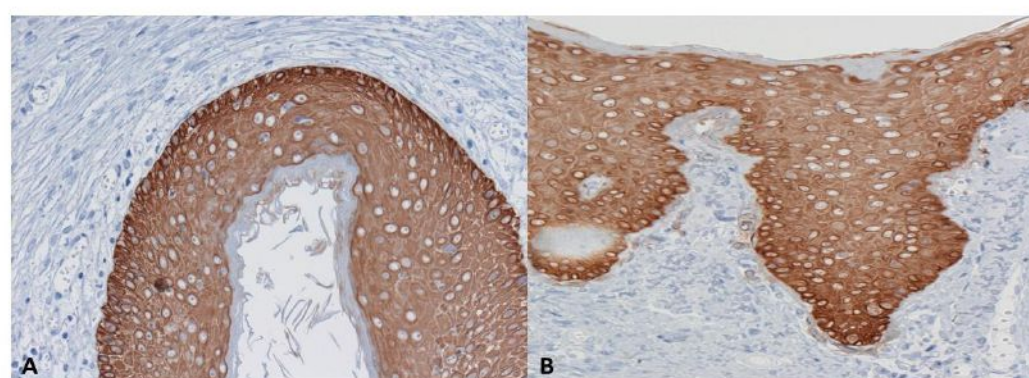
## Methods

An immunohistochemical study was carried out using acquired cholesteatoma (n= 15) and deep meatal skin tissues (n = 6). Tissue samples were collected during cholesteatoma surgery from adult patients with acquired cholesteatoma in a tertiary referral center after getting their informed consent. Mouse monoclonal antibodies were used against cytokeratin 5/6 (CK5/6), cytokeratin HMW (CKHMW), cytokeratin 10 (CK10), cytokeratin 14 (CK14) and cytokeratin19 (CK19). The indirect immunoperoxidase method for immunostaining was employed. Both pattern and intensity of expression of those cytokeratins were evaluated and compared in cholesteatoma and skin tissues by two independent observers. Counting of positive cells was done by the aid of image J counter program

## Results

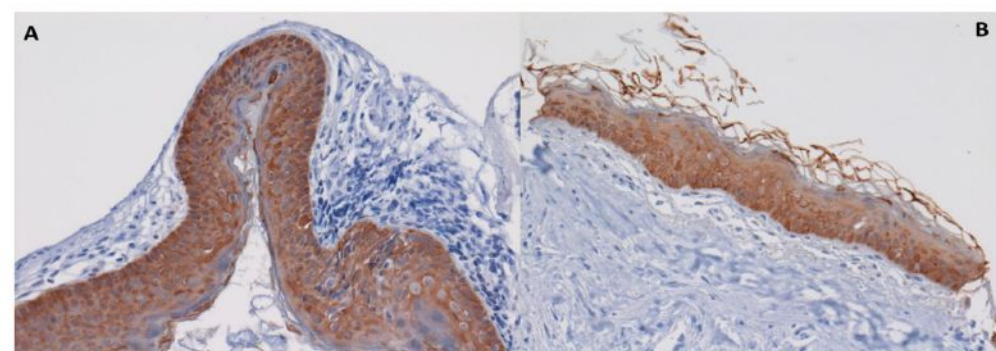
We had 15 patients (10 males, 5 females). Their ages ranged between 18 – 70 years (average 49 years).

With the exception of CK19, all studied cytokeratins were expressed in cholesteatoma matrix and epidermis of meatal skin. In addition, a typical pattern of expression was observed between both tissues. No significant difference in the intensity of expression was found ( $p > 0.05$ ). CK HMW and CK5/6 were expressed in all layers of cholesteatoma epithelium and meatal skin (Fig; 1&2). CK10 was expressed in suprabasal keratinocytes (Fig;3) whereas CK14 was expressed in basal, parabasal and to lesser extent in suprabasal cholesteatoma and skin layers (Fig 4).



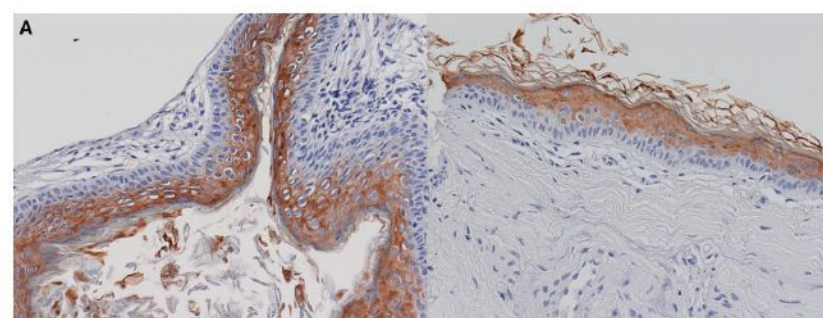
CK 5/6 in cholesteatoma (A) versus meatal skin (B)

Fig; 1 Expression of CK 5/6 in cholesteatoma (A) and meatal Skin (B). Note that all layers of keratinocytes were stained positive in both tissues.



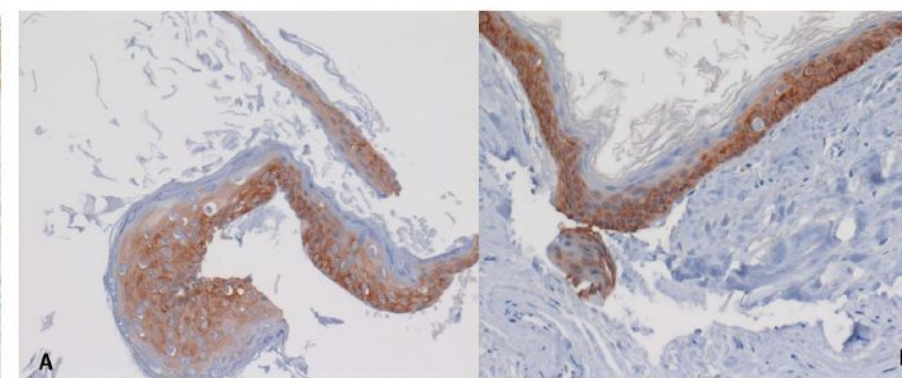
CK HMW in cholesteatoma (A) versus meatal skin (B)

Fig; 2 Expression of CK HMW in cholesteatoma (A) and meatal skin (B). Note that all layers of keratinocytes were stained positive in both tissues.



CK 10 in cholesteatoma (A) versus meatal skin (B)

Fig; 3 Expression of CK 10 in cholesteatoma (A) and meatal skin (B). Note that suprabasal keratinocytes showed positive staining whereas basal/parabasal layers were negative in both tissues.



CK 14 in cholesteatoma (A) versus meatal skin (B)

Fig; 4 CK14 was expressed in basal, parabasal and to lesser extent in suprabasal cholesteatoma and skin layers

## Discussion

Cytokeratins represent a large set of polypeptides that play a crucial role in the proliferation and differentiation of epithelial cells in many proliferative disorders including cholesteatoma.<sup>4,5</sup>

In this work, we found a typical pattern of expression of cytokeratins HMW, 5/6, 10 and 14 in cholesteatoma and deep meatal skin tissues. Additionally, the intensity of expression was quite similar. Our findings support the immigration theory of acquired cholesteatoma. However, no single theory is sufficient to explain all events in acquired cholesteatoma and combination of two or more theories is the most likely presupposition.<sup>6</sup> This knowledge can pave the way for creation of non-surgical treatment option for cholesteatoma.

## Conclusions

Our findings support the immigration theory and confirm the proliferative nature of cholesteatoma. However, more research is needed to clarify how this knowledge can affect the future management of acquired cholesteatoma.

## References

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