

Morphological features of maxillary sinus cysts based on the study of particular histochemical and immunohistochemical factors of inflammation

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The aim: to study the morphological structure and immunohistochemical markers of inflammatory cells in the maxillary sinus cyst wall.

Materials and methods. Biopsy samples of maxillary sinus cysts of 92 operated patients aged 18 to 74 years were studied. We used standard staining with hematoxylin and eosin and PAS reaction for all, and immunohistochemical analysis with monoclonal antibodies (IHC with MAB) to CD68 (macrophages) and CD3 (T-lymphocytes) to determine morphological features and severity of inflammation and PanCK AE1/AE2 antibodies to identify epithelium state for 10 patients (5 with retention cyst and 5 with pseudocyst). The expression of the applied immunohistochemical markers was assessed with a visual analog scale according to the recommendations of D. J. Dabbs “Diagnostic immunohistochemistry” (4th Edition, 2014).

Results. All patients were divided into 2 groups: 29 patients with retention cysts and 63 with lymphagiotatic cysts (pseudocysts), depending on the unilateral or bilateral epithelial lining of the cyst wall. Retention cysts had the bilateral epithelial lining with a saving function and structure with significant expression of PanCK AE1/AE2 and PAS-reaction. The thinned connective tissue layer was filled with separate clusters of lymphocytes and macrophages with low and moderate expression of CD3 and CD68.

Lymphagiotatic cysts were characterized by the unilateral epithelium lining of the wall with signs of degeneration, desquamation, and loss of the mucus-forming function with low expression of PanCK AE1/AE2 and PAS-reaction. Dense infiltration of the connective tissue layer by inflammatory cells with high expression of CD3 and CD68 was observed.

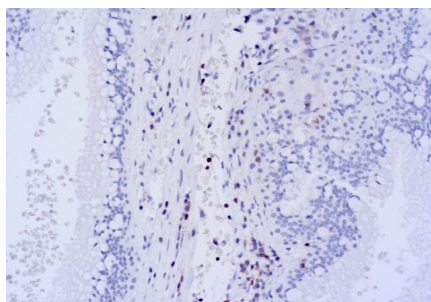


Fig. 1. An insignificant number of positive T-lymphocytes in the retention cyst wall. IHC with MAB to CD3. Magnification: x200.

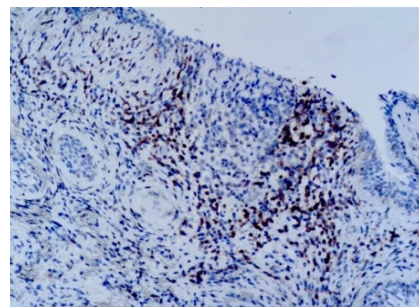


Fig. 2. Pronounced expression and a large number of positive T-lymphocytes in the pseudocyst wall. IHC with MAB to CD3. Magnification: x200.

Table 1. Results of PAS reaction and immunohistochemistry of inflammatory markers in biopsy samples of retention and pseudocysts

Study groups	PAS reaction	PanCK AE1/AE2	T-lymphocytes, CD3	Macrophages, CD68
Retention cyst (n=5)	2.8±0.2	2.8±0.2	1.4±0.24	1.6±0.24
Pseudocyst (n=5)	0.4±0.24	0.6±0.24	2.6±0.24	2±0.31
p	0.012	0.012	0.037	0.46

Conclusions

1. According to the morphological analysis of the walls of cystic formations of the maxillary sinus, 68.5% of cases were identified as pseudocysts, and 31.5% were identified as retention cysts.
2. It was established that the epithelium of a retention cyst retains its function of mucus formation even in case of metaplasia and atrophy, while the epithelium of a pseudocyst almost completely loses it, which was confirmed histochemically using the PAS reaction.
3. T-lymphocytes and macrophages inflammatory infiltration, which was revealed by IHC with MAB to CD3 and CD68, was significantly higher in the pseudocyst than in the retention cyst.