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IMMUNOHISTOCHEMICAL STUDY OF MESENCHYMAL FORMATIONS OF CHRONIC POLYPOID RHINOSINUSITIS

Ulugbek N. Vokhidov
Associate Professor, PhD
Tashkent State Dental Institute
Tashkent, Uzbekistan
E-mail: dr_ulugbek@list.ru

Ulugbek S. Khasanov
Professor, DcS
Tashkent Medical Academy
Tashkent, Uzbekistan

ABOUT ARTICLE

Key words: chronic polypoid rhinosinusitis, morphological study, immune-histochemical study, mesenchymal for-mations.

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Abstract: The aim of the study was to investigate the mesenchymal formations in the stroma of polyps of different forms of chronic polypoid rhinosinusitis. We carried out morphological and immunohistochemical study of paraffin blocks prepared from nasal polyps, which remote by endoscopic operation in 45 patients with chronic polypoid rhinosinusitis in 2013. The study showed that the observation of mesenchymal formations in nasal polyps, which could be regarded as a growth zone of polyps.

SURUNKALI POLIPOID RINOSINUSITISNING MEZENXIMAL FORMASINI IMMUNOHISTOKIMYOVIY O‘RGANISH

Ulug'bek N. Voxidov
Dotsent, PhD
Toshkent Davlat Stomatologiya Instituti
Toshkent, O‘zbekiston
E-mail: dr_ulugbek@list.ru

Ulug'bek S. Xasanov
Professor, DcS
Toshkent Tibbiyot Akademiyasi
Toshkent, O‘zbekiston

MAQOLA HAQIDA

Kalit so’zlar: surunkali polipoid rinosinusit, morfologik o'rganish, immune-histokimyoviy o'rganish, mezenxima shakl-lanishi.

Annotasiya: Tadqiqotning maqsadi surunkali polipoid rinosinusitning turli shakllari poliplari stromasidagi mezenxima shakllanishini o'rganish edi. Biz 2013 yilda surunkali polipoid rinosinusit bilan og'rigan 45 nafar bemorda endoskopik operatsiya yo'li bilan uzoqlashtirilgan burun poliplaridan tayyorlangan parafin bloklarini morfologik va immunogistokimyoviy o'rganishni amalga oshirdik. Tadqiqot shuni ko'rsatdiki, burun poliplarida mezenxima shakllanishini kuza-tish, bu poliplarning o'sish zonasi sifatida qaralishi mumkin.

ИММУНОГИСТОХИМИЧЕСКОЕ ИССЛЕДОВАНИЕ МЕЗЕНХИМНЫХ ОБРАЗОВАНИЙ ХРОНИЧЕСКОГО ПОЛИПОИДНОГО РИНОСИНУСИТА

Улугбек Н. Вохидов
Доцент, PhD
Ташкентский Государственный Стоматологический Институт
Ташкент, Узбекистан
E-mail: dr_ulugbek@list.ru

Улугбек С. Хасанов
Профессор, DcS
Ташкентская Медицинская Академия
Ташкент, Узбекистан

О СТАТЬЕ

Ключевые слова: хронический поли-позный риносинусит, морфологическое ис-следование, иммуногистохимическое ис-следование, мезенхимальные образования.

Аннотация: Цель исследования — изучить мезенхимальные образования в строме полипов при разных формах хронического полиповидного риносину-сита. Нами проведено морфологическое и иммуногистохимическое исследование парафиновых блоков, приготовленных из полипов носа, удаленных эндоскопическим путем у 45 больных хроническим поли-позным риносинуситом в 2013 г. Иссле-дование показало наличие мезенхимальных образований в полипах носа, которые можно расценивать как зону роста полипов.

INTRODUCTION

Chronic polypoid rhinosinusitis (CPRS) is o ne of the most important forms of chronic rhinosinusitis (CRS), which proceeds with the rapid growth of polyps and frequent relapses [1,5,7,11,17,19,22,26,28,29,31,33,36]. CPRS represent a common benign disease affecting 4% of the general population [3,4,6,10,15,16,18,20,21,27,30,32].

CPRS is a disease with unknown etiology, characterized by a persistent symptomatic inflammation of the nasal and sinonasal mucosa [2,5,8,9,12,13,14,23,24,25,34,35]. In patients with CPRS, the epithelium is damaged (partial shedding, complete denudation, or loss of cilia) and shows an abnormal remodeling (goblet cell hyperplasia, basal cell hyperplasia, or metaplasia) [6,8,14,18,25,28,33]. As a consequence, the identification of molecular mechanisms of the upper airway epithelial cells involved in repair, proliferation, and mucociliary differentiation under normal and pathological conditions, offers some potential for the development of new strategies for CPRS treatment [4,5,7].

With this in mind, the study of morphological and immunohystochemical characteristics of the various forms of CPRS is relevant and timely. Based on the above, **the aim** of this study was

to investigate the mesenchymal formations in the stroma of polyps in different forms of chronic polypoid rhinosinusitis.

THE MAIN RESULTS AND FINDINGS

The material of this study were paraffin sections of surgical specimens, remote during endoscopic nasal surgery of 45 patients with diagnosed CPRS aged 18-77 years who were hospitalized in the third clinic of the Tashkent Medical Academy in 2013. The morphological study was conducted with paint on hematoxylin-eosin. Immunohistochemical studies were performed by immunoperoxidase. The primary antibodies used murine monoclonal antibodies - to Vimentin (1: 100 dilution, "Termo", Germany), mouse monoclonal antibody to CD138+ (dilution 1:50, "DAKO", Germany), because these markers help to determine the condition of immunological status in the nasal polyps. The results of the survey were evaluated on the light microscope. Statistical analysis of research conducted on the Microsoft Excel 2010.

The morphological symmetry of postoperative material have been stated the prevalence of eosinophilic infiltration in 33 speciments (73.3%), while in 12 (26.7%) noted the predominance of neutrophil infiltration. This was the basis for the division into 2 groups: patients with chronic "eosinophilic" polypoid rhinosinusitis and patients with chronic "neutrophil" polypoid rhinosinusitis.

As indicated above, we have carried out an immunohistochemical study using monoclonal markers of Vimentin and CD138. Selection of these markers is specific because Vimentin stains mesenchymal cells, which may be located in the stroma of the nasal mucosa, in its side, may describe the picture growth of nasal polyps. CD138 stains a mature epithelial cell, that’s why immunohistochemical picture can determine their presence, expression, as well as some characteristics.

Mesenchymal cells are undifferentiated (immature) cells available in many species of multicellular organisms. Stem cells are able to self-renew, to form a new stem cells divide by mitosis and differentiate into specialized cells, i.e. converted into the cells of various organs and tissues.

From the pictures presented in Figures 1 and 2 can be determined that Expression of Vimentin marker notes in both forms of nasal polyps, but high expression characteristic for "neutrophil" polyps. These figures show the formation of epithelial cells (stained blue) in a cluster of mesenchymal cells (stained brown). On immunohistochemical Figure 1 is determined by the dynamics of mesenchymal cells, it is abundantly towards the epithelium. Also, there is a high expression in the epithelium of macropreparation. This may affect the rapid growth of polyps that often occurs when "eosinophilic" forms polyps.

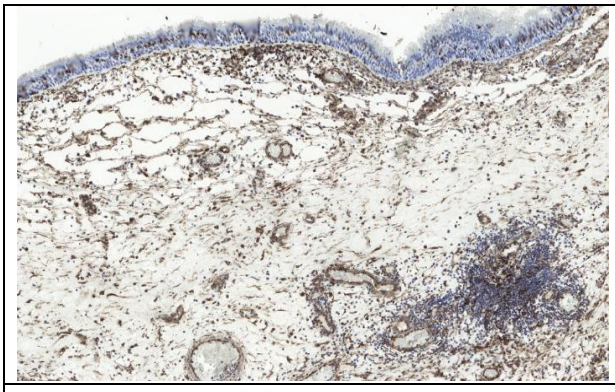	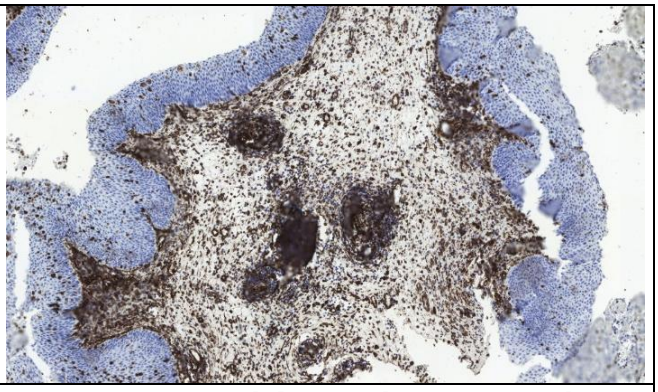
Fig. 1. "Eosinophilic" polyp. Immunohisto-chemical study (x200). There is a high expression of Vimentin in the stroma.	Fig. 2. "Neutrophilic" polyp. Immunohisto-chemical study (x100). There is a high expression of Vimentin in the stroma and mesenchymal formations.

Fig. 2 noted that the presence of high expression of Vimentin in the stroma shows a great activity of mesenchymal cells, which confirms our assumption that these mesenchymal clusters are a place of growth units. In terms of prognostic data of these changes appear to be indicative of future relapses or may indicate the formation of fibrous tissue, which is often present in neutrophilic polyps.

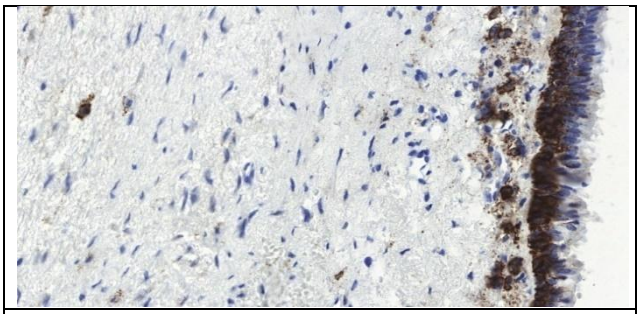	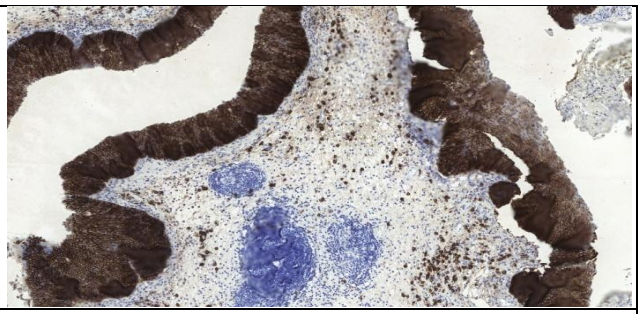
Fig. 3. "Eosinophilic" polyp. Immunohisto-chemical study (x200). There is a high expression of the marker CD138 in the epithelium of the polyp.	Fig. 4. "Neutrophilic" polyp. Immunohisto-chemical study (x100). There is a high expression of the marker CD138 in the epithelium and stroma of the polyp.

In Fig. 3 and 4 there is high expression of CD138 in the mature epithelial cells, as evidenced by the lack of expression of this marker in clusters mesenchymal structures and the average expression in the cells located in the stroma. In the maturation stage epithelial cells gradually directed by mesenchymal cells in the epithelial side. It is possible that the origin of the latter is connected with the activity of mesenchymal cells. The last layer epithelial cells not painted CD138, therefore, this marker are missing.

CONCLUSION

This study supports the hypothesis that nasal polyp tissue located zones, which are responsible for the growth of polyps. In our study, we have given considerable attention to the mesenchymal formations arranged in a ring. In the study using markers found that the basic structures developing in the mesenchymal formations and maturing then sent into the stroma, some in the epithelium. In studies Rezato R. et al. [4], the focus was on metaplasia epithelium and stromal edema. However, I consider the fact that polyps are divided by the infiltration of cellular elements in the two forms, neutrophil and eosinophil, a rich edema in the stroma of polyps noted in "eosinophilic" polyps. In neutrophil polyps, they are, in most cases, the dense and fibrous. In the study by Professor Shin S.H. [5] in Korea shows that chronic rhinosinusitis with polyps are divided into neutrophils and eosinophils, they also note different forms such as seromucinous gland hyperplasia, and stromal atypia types. In our study, those forms were not detected, and it can be a feature of the occurrence in different countries. The main attention should be paid to "growth areas", since they may be the main reasons for relapse polypoid process. Unfortunately, in the literature we reviewed we found quite a demanding attention data "growth zones", in this context, we believe that the information which is reflected in our study is interesting and can open up a new perspective on the pathogenesis of nasal polyps.

Thus, based on the survey data, **it could be concluded that:**

1. Identification of forms of chronic polypoid rhinosinusitis is appropriate to determine the clinical features of polypoid process and followed selection of treatment.

2. Defined in polyps mesenchymal formations, appear to be the growth zone, the presence of which may determine the growth and recurrence of the disease.

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