Nasal cytology detects biofilms

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We read with interest the article of Manciula and colleagues [1]. They explored the possibility of detecting biofilm in tissues collected from patients who underwent nasal surgery and with chronic rhinosinusitis with nasal polyps (CRSwNP), or CRS without nasal polyps (CRSsNP), or septal deviation, recruited as control. The bioptical samples were investigated by scanning electron microscopy or staining with hematoxylin-eosin. The outcomes provided evidence that CRSwNP patients more frequently (76.6%) showed biofilm in nasal tissues than CRSsNP (70%), whereas no control had biofilm. Interestingly, biofilm was associated with eosinophilic and plasma-cellular infiltrate. We would discuss these findings, arguing that biofilm may also be detected using a more straightforward and everywhere available procedure: nasal cytology. Namely, any doctor can perform nasal cytology as it requires nasal swabs, slides, staining, and a microscope. Nasal cytology is a typical example of Precision Medicine as it allows to identify phenotypes (considering the cellular pattern), grade disease severity (counting the cells), diagnose specific diseases (non-allergic eosinophilic rhinitis, such as NARES, could be identified only by cytology), monitor the disease progression, and document the response to treatment [2]. Nasal cytology can be repeated over time as is a very mild invasive method, it is very cheap, and it allows to obtain results practically in real-time.

Moreover, nasal cytology supplies relevant information to calculate the clinical cytological grading (CCG): a fruitful tool for phenotyping patients with CRSwNP [3]. CCG allows defining the prognosis of patients who require surgery, such as predict the probability of surgery recurrence. CCG may also suggest the presence of smell impairment. CCG is also useful to select the best therapeutic option for every CRSwNP patient, including drugs and biologics.

Nasal cytology is a standardized method and grounds on the classic staining method: May-Grunwald-Giemsa. Figure 1 shows a typical picture in one patient with CRSwNP. Using nasal cytology, we previously evaluated many outpatients who attended a Rhinology Unit [3]. Analyzing 1,410 cytology specimens, we observed the presence of particular spots of "cyan" in 107 (7.6%) rhinocytograms [4]. These spots included bacterial colonies and/or fungal spores. Thus we called these colored spot formations "infectious spots." The positivity staining to periodic acid Schiff confirmed the polysaccharide component of these formations. Consequently, we identified the "infectious spots" as a biofilm. This study, therefore, evidenced that nasal cytology can directly detect biofilm. A further study evaluated the presence of biofilm, considering the underlying diseases [5]. Notably, we found that biofilm was more frequently detected in patients with adenoid hypertrophy (57.4%: 31/54), in CRSwNP patients (24%: 32/133), and in CRSsNP (9.5%: 4/42). Biofilm was also detectable in patients with non-allergic rhinitis (7.6%: 22/290), allergic rhinitis (3%: 12/394), and septal deviation (1.5%: 6/392). The inconsistency between our findings and what Manciula and colleagues reported may depend on the different characteristics of enrolled patients and mainly on the different sample sizes.

On the other hand, the most important outcome of our experience is that a simple exam such as nasal cytology may also provide relevant information about biofilm in the nasal cavity. Our outcome's clinical relevance relies on the fact that nasal cytology is a test within everyone's reach. In conclusion, biofilm detection is a crucial step in CRSwNP patients' work-up and can be performed very quickly in clinical practice.

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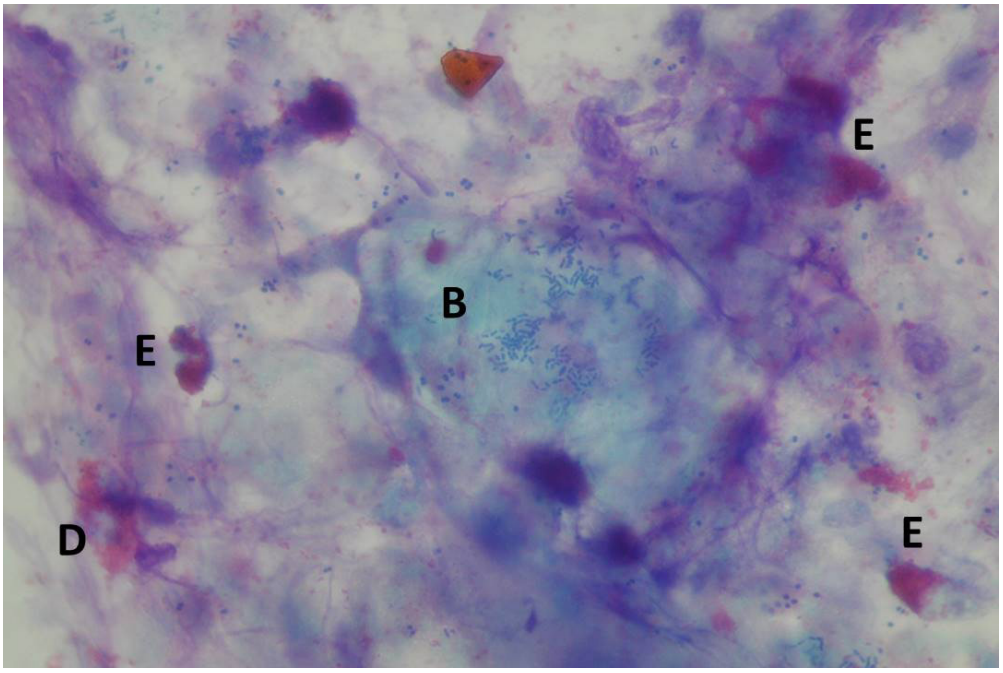

Figure 1. Nasal cytology in a patient with CRSwNP. E = eosinophil; D = degranulation; B = biofilm. The color is typically "cyan" using the May-Grunwald-Giemsa staining.

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