

# Summary

Tear duct obstruction accounts for about 3% of the reasons for visiting ophthalmic offices. Its main symptoms are persistent tearing and recurrent inflammation of the tear ducts. Currently, the basic method of surgical treatment of disorders of the lacrimal patency, in the case of ineffectiveness of conservative methods, is transnasal endoscopic dacryocystorhinostomy which creates a connection between the lacrimal sac directly with the nasal cavity. The effectiveness of this type of procedure in most publications is estimated at around 90%, with a tendency to decrease over a longer period of observation. The main cause of failure is the development of fibrous tissue and scarring at the site of the newly formed anastomosis. This is evidenced by numerous publications using new surgical techniques, new surgical devices and tools, chemotherapeutic agents, and other postoperative procedures to improve healing and reduce the tendency to postoperative fibrosis. Despite the rich literature on the surgical treatment of tear duct obstruction, few authors focus on the attempt to determine the factors predisposing to scarring and restenosis of the produced anastomosis

## **Aim of the study**

The study aimed to evaluate the long-term treatment outcomes of patients with obstruction of the lacrimal duct using the endoscopic method and an attempt to determine the factors predisposing to the development of tear duct restenosis after surgery.

## **Material and methods**

The study included 47 patients, 17 (36.2%) men and 30 (63.8%) women aged 18 to 94 years (mean 62.3) with the so-called low type of obstruction of the tear duct, i.e. concerning the lacrimal sac and nasolacrimal canal. In the preoperative examination, the intensity of symptoms, their duration and the type of dominant symptoms were assessed. All patients were operated using the same surgical technique (endoscopic dacryocystorhinostomy) and were subject to the same postoperative management regimen. The size of the pouch cavity, wall thickness and the presence of adhesions in its lumen was assessed intraoperatively. The intensity of fibrosis was analyzed using trichromatic staining and infiltration of inflammatory cells with the use of specific antibodies: anti-CD68 for macrophages, anti-CD3 for T lymphocytes and anti-CD20 for B lymphocytes. Surgical treatment results were assessed after at least one year of observation period based on visual analog scale, as well as the irrigation test and the modified Jones endoscopic test. The result of 0 and 1 on the subjective analog scale, confirmed by a positive result of the lacrimal irrigation test, was considered a cure success - complete loss of tearing. Partial improvement is at least a 50% reduction in the severity of tearing, determined by the patient on an analog scale with the irrigation test confirmed and the anatomical patency of the tear ducts preserved. No improvement is a reduction in discomfort / tearing by less than 50%.

## **Results**

After an observation period of at least one year, complete recovery and partial improvement, confirmed by a positive irrigation test result, were found in 43 (91.4%) patients (complete resolution of symptoms - 37 patients (78.7%), partial relief of symptoms - 6 patients (12.7%), in 4 (8.5%) patients tearing was not reduced.

Among the analyzed data from the clinical history (age, sex, duration of ailments, the dominant type of ailments), intraoperative assessment (size of the lacrimal sac, its wall thickness, adhesions inside the sac), histopathological and immunohistochemical examinations (intensity of fibrosis and infiltration of macrophage, T and B lymphocytes) a statistical relationship with the treatment results was obtained only in the case of the intensity of adhesions in the lacrimal sac ( $p = 0.029$ ) and gender ( $p = 0.0073$ ).

## **Conclusions**

In the study group, a positive result of surgical treatment was achieved in 91.48% of cases. This proves the high effectiveness of the method used, taking into account the long period of observation of the operated patients.

Among the studied patients, the worse results obtained in the group of women than in men may be explained by a certain predisposition of women to the presence of impaired patency of the tear ducts caused by hormonal processes leading to exfoliation of the epithelium in the anatomically narrower tear ducts.

The high intensity of adhesions in the lacrimal sac, found intraoperatively, turned out to be the only factor (apart from gender) predisposing to restenosis of the created sac-nasal anastomosis. Modification of intra- and postoperative procedures by the use of stents for tear ducts, local application of antimetabolic drugs, and more frequent postoperative control visits with irrigation of the tear ducts could positively influence the results of surgical treatment in these patients.