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Chapter 2: Background for surgical intervention in DED.

2.0 Introduction

Moderate cases of DED, where the problem is not yet pathological, are typically treated by compensating for the lack of tear quality (substitution) and/or quantity (addition of artificial tear fluid).

In more severe cases where the patient fails to respond to the above forms of treatment, surgery is an option. Surgery for DED can have (a combination of) one out of 4 objectives [Kruse et al., 2006]:
- reduction of tear clearance (e.g. closure of tear puncta);
- addition of tears or tear components to the ocular surface (e.g. transplantation of salivary glands);
- decreasing the area of evaporation of tears (e.g. tarsorrhaphy, induction of ptosis);
- surgical correction of diseases that contribute to dry eyes (e.g. repair of eyelid pathology such as ectropion or trichiasis).

The surgical therapy of DED through autotransplantation of labial salivary glands to the eyelids, was originally described by Murube [1998]. Our most important modification of this technique was the use of Radiofrequency (RF) surgery and the use of a running subconjunctival polypropylene suture to fix the graft (Chapter 3.2).

Because of the similarity between low frequency electro surgery (500 KHz; which causes significantly more tissue destruction) and RF surgery with high frequency radio waves (4.0 MHz), scientific evidence was needed to justify the modification of Murube’s surgery, who already described excellent results.

In Chapter 2.1 the history of RF surgery is covered, and also the modifications that have led to the success of high frequency low temperature RF surgery and the explanation for the superior results of RF surgery as compared to electro surgery or surgery with a blade.

The study of upper lid blepharoplasty without cutting the orbicularis muscle with RF surgery (Chapter 2.2) shows that with RF surgery the thin skin of the upper eyelid can be excised selectively. The same careful dissection is needed when dissecting the conjunctiva to prepare the recipient bed of the tarsal conjunctiva for the graft and also for the excision of the labial mucosa and underlying salivary glands. Excessive bleeding during prelevation of the graft with a blade jeopardizes the survival of the transplant. And too much coagulation as with electro surgery can destroy the precious and delicate salivary glands.

Everting the eyelids during the transplantation surgery is similar to what is done in a transconjunctival lower lid blepharoplasty (Chapter 2.3) when a Desmarres lid retractor is used. Also in this type of lower lid blepharoplasty, a careful dissection of the tarsal conjunctiva is needed, avoiding damage to the underlying structures and limiting intra- and post-operative bleeding.

When performing transplantation of labial salivary glands, bleedings can delay or prevent vascularization and thus survival of the graft.

The use of the Raus-Garito clamp (Chapter 2.4) is another example of how RF surgery allows selective dissection of small and superficial layers of tissue and illustrates how everting the eyelid facilitates surgery of the conjunctiva by stretching the tissue.
We conclude that RF surgery may have added value to the transplantation of labial salivary glands to the eyelids.

References: