Bleb survival in subscleral trabeculectomy

Essay

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Introduction :

Since first described by Cairns in 1968[1], trabeculectomy (SST) has been widely used and remains the gold standard in surgical treatment of glaucoma. Long-term success depends on preoperative and intraoperative conditions, but long-term success also highly depends on the persistence of filtration efficiency at the bleb site. [2,3]

The decision to proceed with glaucoma surgery must include an evaluation of risk factors other than IOP alone ; those were described in the major recent randomized controlled trials of glaucoma treatment such as the age of the patient , race , central corneal thickness , cup-to-disc ratio , uveitis[4] , neovascularization [5]& cataract surgery [6] .

In addition, other factors were assessed and found to be noncontributory, others were found to be protective . All of these factors should be considered prior to proceeding to surgery .[7]

Once the decision to proceed with glaucoma surgery has been made, several factors should be considered during surgical planning such as patient age , external disease , general health status & ocular surface disease . Careful pre-operative evaluation must be performed to determine the optimal site and type of glaucoma surgery, including the use of antifibroblastic agents. [7]

The use of anti-fibrotic agents in filtering procedures is associated with a higher success but also with a higher complication rate (hypotony due to over-filtration, bleb leak, and ocular infection). For this reason an individualized consideration of the risk/benefit ratio is recommended [8].

. Mitomycin C (0.1–0.5 mg/ml solution) is more potent than 5FU & so has been widely used intraoperative more than 5FU [9] .

Trabeculectomy with collagen matrix implant (ologen)™ implant has proven nearly the same safety & efficacy of trabeculectomy with Mitomycin C [10] .

The anti-inflammatory effects of hyaluronic acid and its space-occupying properties may be useful in filtering glaucoma surgery , so injections of HealaFlow® below the scleral flap and the conjunctiva at the end of the surgery showed promising IOP-lowering effects in trabeculectomy [11] .

Bevacizumab may also be promising in lowering IOP when used intra operative specialy in neovascular glaucoma management . [12]

An adjustable suture system can be added to allow a gradual titration of the intraocular pressure—more gradual than that seen with suture removal or massage [13].

Glaucoma suture lysis is widely used

postoperatively to achieve target pressures. [14].

Bleb needling should be considered when a bleb fails post surgery. It has multiple advantages over re-operations. . [15]

Postoperative observation and care of the developing filtering bleb in clinical practice is an important tool in reaching the target pressure after filtration surgery in a higher percentage of the patients [2] . The success of filtration surgery depends greatly on the early recognition and appropriate management of postoperative complications. Although the list of potential complications following filtration surgery is extensive, in most scenarios a short differential can be obtained by knowing only three key elements; anterior chamber depth, intraocular pressure, and bleb status.[6]

Digital ocular compression and focal compression can be used to improve the function of a temporarily non- or poorly functioning filtering bleb with the use of frequent steroids. Digital ocular compression (DOC) can be applied to the inferior sclera or cornea through the inferior eyelid, or to the sclera posterior to the scleral flap through the superior eyelid [16] .

Aim of this Study:

The aim of this essay is to discuss preoperative , intraoperative & postoperative measures to ensure bleb survival in trabeculectom . And the causes , prevention & management of bleb failure.

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List of abbreviations

5FU : 5-Fluorouracil

AGIS : Advanced Glaucoma Intervention Study

ALT : argon laser trabeculoplasty

FFSS : The fluorouracil filtering surgery study

GAG :glycosaminoglycan

IBAGS : Indiana Bleb Appearance Grading Scale

IOP : intra ocular pressure

MMC : Mitomycin-c

MBGS : Moorfileds Bleb Grading System

OLO : Ologen

PACG : primary angle-closure glaucoma

POAG : primary open angle glaucoma

SST : subscleral trabeculectomy

VEGF : vascular endothelial growth factor

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Introduction

Since first described by Cairns in 1968 subscleral trabeculectomy (SST) has been widely used and remains the gold standard in surgical treatment of glaucoma .[1]

The chief aim of this operation is to allow aqueous to bypass the trabecular meshwork into the subconjunctival space, but at the same time , ensuring an optimum intraocular pressure (IOP) (i.e., not too high or too low) as well as maintaining the anatomy of the globe (i.e., preventing shallowing of the anterior chamber). [2]

In this operation an initial pocket is created under the conjunctiva and Tenon's capsule and the wound bed is treated for several minutes with mitomycin C (MMC) or 5-fluorouracil (5-FU) soaked sponges. These chemotherapeutics help to prevent failure of the filtering bleb from scarring by inhibiting fibroblast proliferation. Alternatively, non-chemotherapeutic adjuvants can be implemented to prevent super scarring by wound modulation, such as collagen matrix implant . A partial thickness flap with its base at the corneoscleral junction is then made in the sclera and a window