Transscleral drainage of subretinal fluid revisited

Fashioning a puncture hole through the sclera, choroid, Bruch’s membrane, and retinal pigment epithelium for external drainage of subretinal fluid (SRF) may not be conceptually challenging, but the multiplicity of reported methods attests to the problems experienced in achieving the desired end smoothly and without extracranial egress of the retina or intraocular complications. The latter include retinal perforation and choroidal haemorrhage with subretinal or suprachoroidal spread. Until recently, the relative efficacy and safety of these various SRF drainage procedures had seldom been investigated through clinical trials, perhaps reflecting the variability of presentation of rhegmatogenous retinal detachments and the influence of the charismatic schools of vitreoretinal surgery in shaping opinions.

Incremental deepening of a 2-4 mm long scleral incision1-10 permits choroidal exposure, visualisation and possible coagulation before chordoidotomy, but necessarily invokes a risk of inadvertent choroidal puncture, retinal incarceration, and potential reopening of the sclerotomy at reoperation. By contrast, the much smaller sclerorhoidal opening after hypodermic needle or suture needle drainage11-13 virtually eliminates the risk of incarceration while inviting chordoid medical haemorrhage. Thus the intraocular pressure is a pressure maintained high enough and long enough for haemostasis to become established. After scleral cutdown, the choroid can be coagulated by cautery or diathermy12,5,6 before mechanical puncture; alternatively, choroidal vapourisation without intrusion using either diathermy6 or an argon laser (via a fibroptic probe or the indirect laser delivery system)7-10 aims to reduce the risk of haemorrhage, retinal perforation, or failure of drainage. Although initial lower energy, longer duration coagulation of the choroid tends to reduce choroidal haemorrhage on subsequent vapourisation,2,6,9 it also lowers the rate of first time success of SRF drainage8 while retinal perforation remains a possibility.9,13 The risk of haemorrhagic complications is also felt to reflect the site of SRF drainage—that is, with a reduced risk at the watershed of vortex vein territories near the horizontal (as opposed to the vertical) recti5,4,14 and the sequence of individual retinal procedures—that is, with a putative benefit from drainage before cryotherapy.4,13,14 However, few of these manoeuvres have been supported by substantive evidence through clinical trials. Prospective studies tend to be more objective than retrospective studies, a healthy scepticism ensuing when a retrospective search of patient records is reported to reveal no drainage complications and 100% reattachment.6 Furthermore, independent, extended use of a particular technique (such as hypodermic needle drainage12,14) may fail to endorse initial enthusiasm, but sometimes reflects difficulties in general applicability of the method or faults in following technical guidelines.

Given the inappropriateness of historical comparisons, prospective randomised controlled trials of different SRF drainage procedures12,14 have been informative, albeit none has employed masked observers. No major disparity in haemorrhaging was observed between laser drainage and needle chordoidotomy (without choroidal coagulation) in a recent trial by Ibanez and others.10 But, in this issue of the BJO, Aylward and colleagues (p 724) report that their trial comparing argon laser chordoidotomy with suture needle sclerorhoidal perforation was terminated early when an interim data analysis revealed ‘a large and statistically significant difference in the incidence of clinically significant subretinal haemorrhage between the two groups’. They had observed a 28-3% incidence of ‘small or large’ haemorrhages (that is, those over one disc area in size) in the suture needle drainage group compared with only 4-3% in the laser chordoidotomy group. However, this was perhaps an unduly precipitate conclusion to the study. Submacular haemorrhage and retinal incarceration are arguably the most ‘clinically significant’ indices of hazard from any SRF drainage technique, while peripheral subretinal haemorrhage is not necessarily a risk factor for surgical failure1 or development of proliferative vitreoretinopathy.2 Thus, using these alternative criteria, they would have found no significant difference between the two techniques at that juncture. Also, notwithstanding earlier comments about historical comparisons, their 28-3% incidence of subretinal haemorrhage (and 12-5% incidence of submacular haemorrhage in macula off detachments) after suture needle drainage differs markedly from the 7-4% and 0% incidence respectively in a previous report.13 The propensity to submacular haemorrhage depends on the relative densities of blood and SRF (with viscid long standing SRF slowing the gravitational flow of blood beneath the macula) but also on the method used to limit the choroidal haemorrhage once initiated. Aylward and colleagues closed the drainage site when haemorrhage occurred during suture needle drainage, thus preventing regurgitation of blood alongside the SRF and thwarting the flattening of the retina which might have discouraged settling of haemorrhage under the macula.

The Moorfields trial does, however, point to the need to develop an SRF drainage method which combines the ease and convenience of suture needle drainage with the more secure haemostasis deriving from laser chordoidotomy. This has been achieved experimentally using carbon dioxide laser sclerorhoidotomy13 and holds promise clinically using the transscleral diode laser to coagulate the choroid before suture needle drainage16 and diode laser retinotomy. Let us look forward, then, to a prospective, randomised, controlled trial to establish the true worth of this method. In the meantime, retinal surgeons using direct sclerorhoidal perforation for SRF drainage will have to judge for themselves whether wholesale conversion to laser chordoidotomy is warranted from the available evidence.

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