No excuse for not looking

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Any iatrogenic complication would be upsetting to a surgeon, knowing that a patient acquired an undesirable effect as a result of something that he or she did during surgery. Causing retinal breaks or retinal detachments (RD) is a prime example of one such iatrogenic complication. The fact that we, as surgeons, are responsible is all the more obvious when patients did not have retinal breaks or RD before surgery.

In this issue, Jalil et al. conducted a large retrospective study of patients undergoing pars plana vitrectomy (PPV) for indications other than rhegmatogenous RD, comparing the incidence of iatrogenic retinal breaks and RD between 20-gauge standard PPV and 23-gauge transconjunctival “sutureless” vitrectomy (TSV) [1]. They examined over 900 patients that underwent PPV over a 2-year period for epiretinal membrane, macular hole, vitreo-macular traction, advanced proliferative diabetic retinopathy including vitreous haemorrhage and tractional RD, and retained lens fragments. Patients with rhegmatogenous RD, previous PPV and perforating injuries were deliberately excluded. They found that the incidence of entry site break was 7.9 % with 20-gauge standard PPV and 1.7 % with 23-gauge TSV. In the same issue is a study by Cha et al. involving over 1,300 vitrectomies and they found iatrogenic peripheral retinal

breaks to be 6.2 % with 20-gauge standard PPV and 1.6 % with 23-gauge TSV [2].

The results were not surprising. Most of us have the impression that the use of cannula was associated with lower incidence of “entry-site” tear. It does not appear to depend on the gauge of the instruments used either. In 1985, Machemer and Hickingbotham introduced a 3-port microcannular system for closed vitrectomy [3]. This system did not gain widespread popularity, partly because of the additional cost involved and partly because the sclerotomies were nearer 19-gauge in order to accommodate the 20-gauge instruments. Nevertheless, those who had used the system, including myself, attest to the fact that entry site tears were rare. Similarly, Covert et al. reported intraoperative retinal breaks in a series of TSV (with cannula) and found that the incidence to be similar between 20-, 23- and 25-gauge (being 1 in 59 eyes, 3 in 76 and 3 in 76 cases respectively) [4].

Why should the use of a cannula system be associated with a lower incidence of entry site tears? It is speculated that the cannula protects the vitreous base from the trauma of repeated insertion of instruments, especially those with awkward shapes (such as scissors and forceps). However, with or without cannula, vitreous incarceration into the sclerotomies is inevitable. Indeed, with a sutureless system, the maintenance of post-operative intraocular pressure is dependent on vitreous plugging the openings. With a cannula system, it is the basal vitreous gel around the sclerotomy that becomes incarcerated, whereas without the protection of a cannula, the posterior hyaloid face can become incarcerated and therefore traction on the posterior border of the vitreous base remote from the sclerotomy may ensue.

There are probably many additional confounding factors for iatrogenic retinal breaks formation: the complexity of the surgical manipulation; the extent of vitreous base shaving; the efficiency of different cutters and the experience of the surgeon might all influence the rate of unintentional retinal tears. Therefore, it is unlikely that a randomized trial would ever be conducted controlling for all these confounding factors. The

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question as to which system is best will depend on the evidence provided by large retrospective studies. The answer, to a certain extent, might be academic as an increasing number of surgeons are already persuaded by the many advantages conferred by TSV and as such have already converted to using smaller gauge systems [5].

Using a multivariate logistic model of risk factors for the development of anterior retinal breaks (both entry site tears and non-sclerotomy related anterior breaks), Jalil et al. found that the use of 23-gauge was the most important factor reducing the risk of anterior breaks ($p < 0.0001$, $OR = 62.84$). However, the induction of posterior vitreous detachment (PVD) was also found to be influential. A significantly higher proportion of patients had PVD induced at surgery in eyes that developed retinal tears than in eyes that did not develop retinal tears ($p = 0.2$, $OR = 2.62$). This was the case irrespective of whether 20- or 23-gauge was used.

It seems that there is some evidence that the use of 23-gauge vitrectomy with cannula may confer a degree of protection from iatrogenic retinal tears, though they could still occur especially in cases where PVD had to be induced. There is another and arguably more important finding in Jalil's paper that might be missed by the cursory reader. In my opinion, the salient point is that very few patients went on to develop subsequent RD: seven out of 628 with 20-gauge patients had RD (1.1 %) and two out of 296 with 23-gauge TSV patients had RD (0.67 %). I am convinced that it must be related to their standard technique: "all cases underwent an internal search with scleral indentation to

identify iatrogenic anterior retinal tears and sclerotomy-associated retinal tears towards the end of the procedure, and these were treated accordingly".

It is said, "Only those surgeons who do not operate will experience no complications". We need not feel so guilty about iatrogenic retinal breaks when a certain incidence is probably unavoidable irrespective of which system we choose to use routinely. What is unforgivable is not to examine the retina at the end of surgery. If we always look and treat appropriately then we can all sleep a little easier.

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