The absence of microhyphema on the first postoperative day seems to be a negative prognostic indicator in uneventful canaloplasty procedures in patients with primary open angle glaucoma (POAG), according to a study presented at the XXIX Congress of the ESCRS.

“Our study indicates that the absence of microhyphema after uneventful canaloplasty seems to be a poor prognostic factor in relation to IOP reduction and these eyes required more frequent and earlier Nd:YAG laser goniopuncture after surgery,” said Matthias C Grieshaber MD, FEBO, a consultant at the Department of Ophthalmology, University of Basel, Switzerland.

Microhyphema is defined as a small hyphema characterised by suspended red blood cells in the anterior chamber without the formation of a layered clot (Figure 1). The potential complications of a microhyphema are the same as hyphema including IOP elevation and secondary haemorrhage.

Dr Grieshaber said that the prospective non-randomised study was carried out to assess the risk factors for failure in canaloplasty, a technique he described as a non-penetrating, bleb-independent procedure using micro-catheter technology.

“In canaloplasty, the superficial and deep scleral flaps are dissected in order to unroof Schlemm’s canal which is then circumferentially diluted and cannulated with a special micro-cannula. After full completion of the cannulation, a prolene suture is tied to the distal end of the tip and looped through the canal in order to stretch the inner wall of Schlemm’s canal (Figure 2). Importantly at the end of surgery the superficial flap is sutured watertight to avoid bleb formation but also to reinforce aqueous running through the physiological outflow system,” he said. (Figure 3.)

Dr Grieshaber’s study included 47 consecutive patients with medically uncontrolled POAG who underwent primary canaloplasty. The mean preoperative IOP was 26.8 mmHg and the mean cup-to-disc ratio was 0.82. The average patient age was 70 years and the mean number of glaucoma medications was 2.8.

Most of the patients had microhyphema on day one after uneventful canaloplasty (85.1 per cent), said Dr Grieshaber.

“When we looked at the success rate of an IOP below 16 mmHg without medications we found microhyphema to be a positive prognostic indicator, whereas age, preoperative IOP, cup-to-disc ratio and gender were not prognostic indicators,” he said.

A subgroup analysis was then carried out to determine if any difference could be found between eyes with and without microhyphema on day one postoperatively.

“While there was a slightly increased IOP before surgery in the eyes with microhyphema, it was not statistically significant. Interestingly most of the eyes without microhyphema needed laser goniopuncture after surgery and the time interval between surgery and goniopuncture was much shorter in the eyes without microhyphema. However, there were no differences in the group in regard to age, preoperative IOP, cup-disc ratio or number of medications before surgery and on postoperative IOP at day one,” Dr Grieshaber said.

Focusing on the mean postoperative IOP, the eyes with microhyphema had a consistently lower IOP than those without, and that was true at each time point, he said. “Those eyes without microhyphema had an increase in IOP, and then we did laser goniopuncture and the IOP dropped again but it remained on average higher than the eyes with microhyphema,” he said.

Dr Grieshaber noted that Kaplan-Meier survival curves for complete success rate of IOP pressure target showed that the lower the IOP target was fixed, the greater the difference that emerged between the two groups.

“We had 87 per cent complete success rate in the eyes with microhyphema compared to 21 per cent for those eyes without microhyphema for a target IOP under 16 mmHg, whereas it was 97 per cent versus 71 per cent respectively for a target IOP less than 21 mmHg. Likewise if the complete success rate was defined as a 30 per cent IOP reduction, the difference was 88 per cent versus 38 per cent for the microhyphema eyes compared to non-microhyphema eyes. Nevertheless, we did not find any factors associated with microhyphema in terms of age, preoperative IOP, cup-to-disc ratio or gender,” he said.

Summing up, Dr Grieshaber said that the evidence of his study suggested that the absence of microhyphema after uneventful canaloplasty seems to be a poor prognostic factor in relation to IOP reduction and that these eyes required more frequent and earlier Nd:YAG laser goniopuncture after surgery.

“We need to remember, however, that there was an IOP drop after goniopuncture, so creating a sufficiently large Descemet’s window might be important also in canaloplasty by serving as a back-up. If we consider the microhyphema as blood reflux from the episcleral veins, this may indicate a restored outflow system with permeable trabecular meshwork. However, it is not a sign of low IOP on day one since there was no difference between the two groups.

It is also unclear whether it is an indicator for proper suture tension, so further research is needed to assess the genuine effect of the tensioning suture in canaloplasty,” he concluded.