Aqueous angiography guided ab interno trabecular surgery for open-angle glaucoma

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DESCRIPTION

We present a novel technique to aid in decision making during minimally invasive glaucoma surgery. The aqueous outflow pathways are imaged using aqueous angiography and then the site of maximal outflow is localised to perform ab interno trabecular surgery.1 A 53-year-old man presented to our glaucoma clinic with diagnosis of pseudophakia with glaucoma with intraocular pressure (IOP) of left eye 26 mm Hg (on four topical medications) and vertical cup disc diameter ratio of 0.9:1. Aqueous angiography was performed using FLEX module Spectralis HRA+OCT (Heidelberg Engineering GmbH, Heidelberg, Germany) after indocyanine green (0.5%) injection into the anterior chamber, to visualise the main aqueous outflow channels.2 An outflow channel in the nasal quadrant was identified as the region of maximal flow3 (figure 1) and the trabecular meshwork was excised for 30° in the same area using a bent 26 G needle (BANG—bent ab interno needle goniotomy). The dye was reinjected to evaluate the increase in outflow after trabecular meshwork (TM) removal (figure 2). Postoperative day 1 left eye IOP was 10 mm Hg and 12 mm Hg at 1 week (on three topical medications).

This technique highlights the beginning of a new era in glaucoma surgery with the use of aqueous angiography to facilitate focal surgery on the Schlemm's canal adjacent to an outflow channel, avoiding unnecessary tissue damage by operating on a wider circumference of the canal.4

Learning points

- This novel technique highlights the beginning of a new era in glaucoma surgery by using aqueous angiography to target the maximal aqueous outflow channels thereby reduces unwanted tissue damage.
- Helps in decision making in minimally invasive glaucoma surgeries.

Figure 1  (A) Pre-bent ab interno needle goniotomy (BANG) gonioscopy showing open angle with trabecular meshwork and prominent iris processes. (B) Anterior segment optical coherence tomography (ASOCT) of angle showing trabecular meshwork (TM) with a canal of Schlemm (SC). (C) Indocyanine green angiograph (ICG) guided pre-BANG aqueous drainage with a prominent nasal network of aqueous channels.

Figure 2  (A) Post-bent ab interno needle goniotomy (BANG) gonioscopy showing the white area where a strip of trabecular meshwork (TM) has been removed in the angle. (B) Anterior segment optical coherence tomography tomography (ASOCT) of angle post-BANG showing excised TM with open Schlemm (SC). (C) Indocyanine green angiograph (ICG) post-BANG with accentuated aqueous drainage through nasal network of aqueous channels.

Contributors

AN was involved in data acquisition, manuscript drafting, preparation and intellectual input and approved the first manuscript. TD was involved in performing the novel technique, intellectual input and approved the final manuscript.

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Competing interests

None declared.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.
REFERENCES