

# Prof Robert Elliot of Madras & the development of trephining bleb development via the cornea

Philip Rothschild\*<sup>1</sup>, Rahul Chakrabarti<sup>1</sup>, David Kaufman<sup>1</sup>

<sup>1</sup> Royal Victoria Eye and Ear Hospital,  
Melbourne, Victoria, Australia

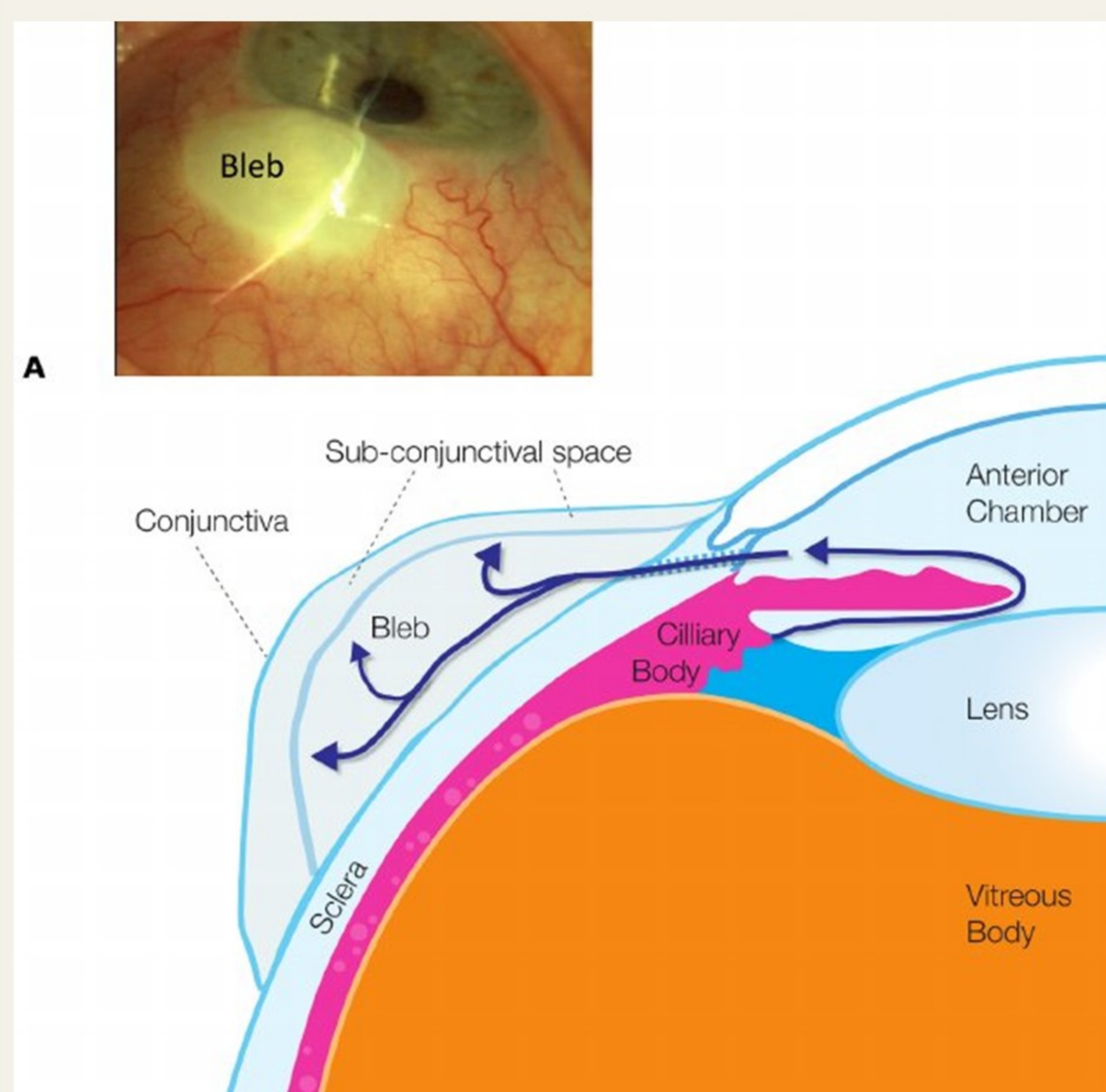
RANZCO |  | MUSEUM

## What is filtration surgery?

Filtration surgery: where an alternative outflow pathway is created for aqueous fluid.

This is done via the following:

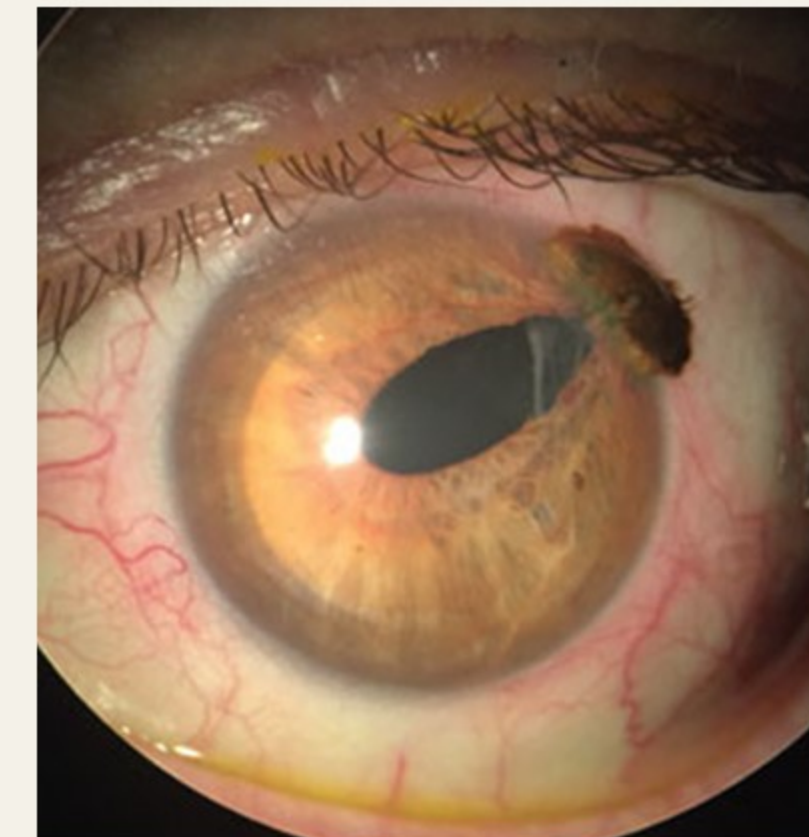
1. A small opening is made to allow the aqueous to leave the eye (a trabeculectomy);
2. The scleral flap is then sutured down and adjusted to control fluid outflow;
3. The conjunctiva is then sutured closed watertight. Escaping aqueous forms a blister or “bleb” under the eyelid from where it is absorbed into the venous system.



## What form of filtration surgery existed pre-Elliot?

Prof Pierre Lagrange of the University of Bordeaux developed the following in 1907:

- Combined iridectomy and sclerectomy to create a fistula to the conjunctiva.
- **Sequalae of this technique:**
  - Larger areas of excised sclera
  - Prolapsed iris
  - Bleb leak with flat AC, hypotony



Example of prolapsed iris

## How did Elliot advance filtration surgery?

In 1909, Elliot pioneered an ab externo glaucoma drainage approach.

→ He developed sclero-corneal trephining to create a fistula to the conjunctiva, thereby creating a bleb.



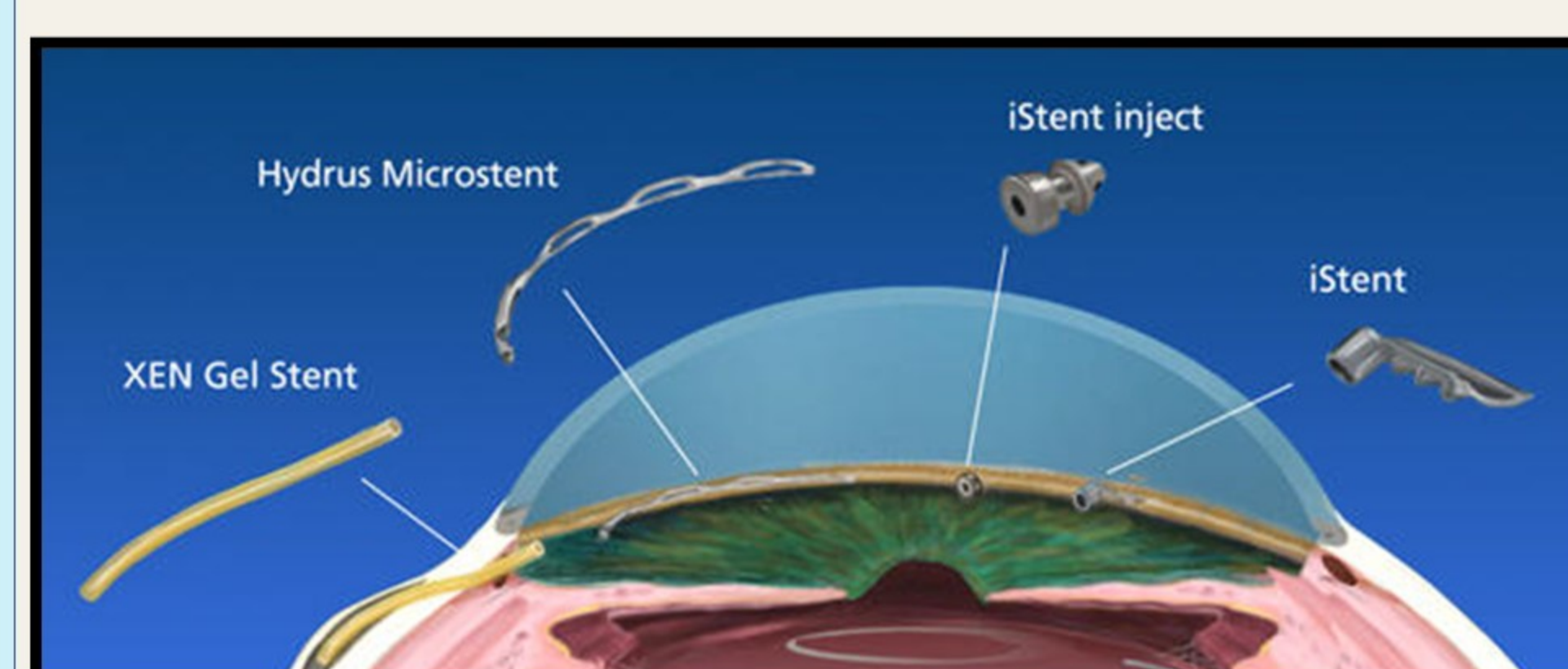
Elliot trephines, measuring 1-2mm

## What was the main difference to Bordeaux's procedure?

- Elliot was the first to propose dissecting a short passage into the cornea before using the trephine.
- Many earlier procedures such as Holth and LaGrange sclerectomy involved excising larger areas of sclera whereas Elliot's trephine was 1.5-2.0mm, affording a more controlled leak.
- This was a premier procedure in glaucoma management at least until the 1940s, where it declined in use due to excess drainage, bleb rupture, bleb infection, and cataract.

## What does 21<sup>st</sup> century filtration surgery look like?

In short, whilst the trabeculectomy and bleb formation procedures have improved, minimally invasive glaucoma surgery is becoming increasingly popular.

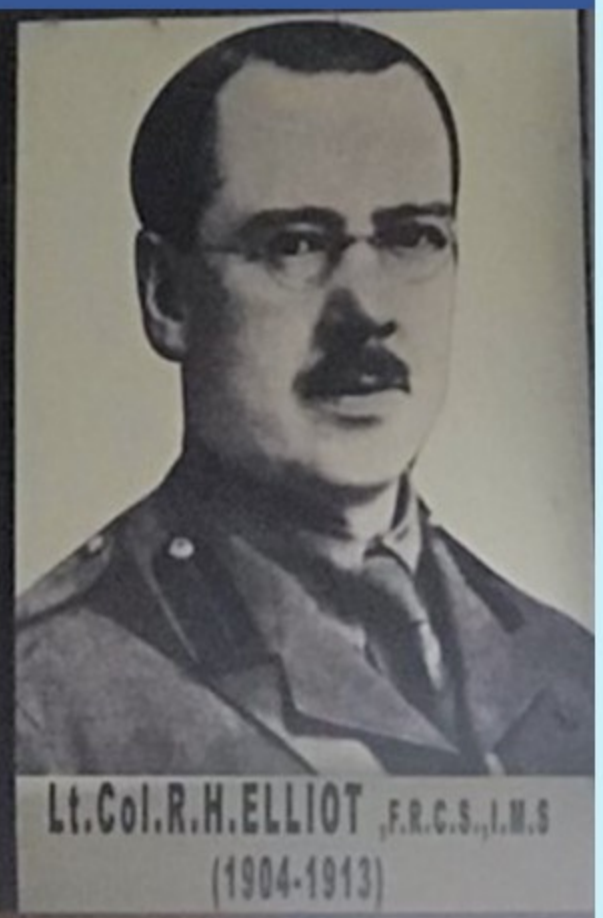


## Who was Elliot?

Prof Robert Elliot FRCS

Born: 23/08/1864, England

- Entered the Indian Medical Service and began serving as a lieutenant-surgeon in 1892



Between 1904-1914, he was:

- Superintendent of the Government Ophthalmic Hospital, Madras, India; and
- Professor of Ophthalmology at Madras Medical College.



Images provided by Dr Kaufman following a (pre-Covid!) trip to India in 2020 to assist the Indian Ophthalmological Museum Service



## References

- <http://primaryeyecarect.com/services/glaucoma-care-treatment/filtration-surgery-trabeculectomy>
- <https://www.currentscience.ac.in/Volumes/118/08/1313.pdf>
- [https://en.wikipedia.org/wiki/Robert\\_Elliot\\_\(surgeon\)](https://en.wikipedia.org/wiki/Robert_Elliot_(surgeon))

## About the authors

Philip Rothschild is a current HMO at the Royal Victorian Eye and Ear Hospital, Victoria.



Dr Rahul Chakrabarti

FRANZCO and Dr David Kaufman FRANZCO are both consultant ophthalmologists affiliated with the RVEEH. Dr Kaufman leads the RANZCO Historical Museum service.