

The 'G-Series'

MOLTENO³

GS - 175mm² GL - 230mm² Glaucoma Drainage Device

**Single plate
simplicity**

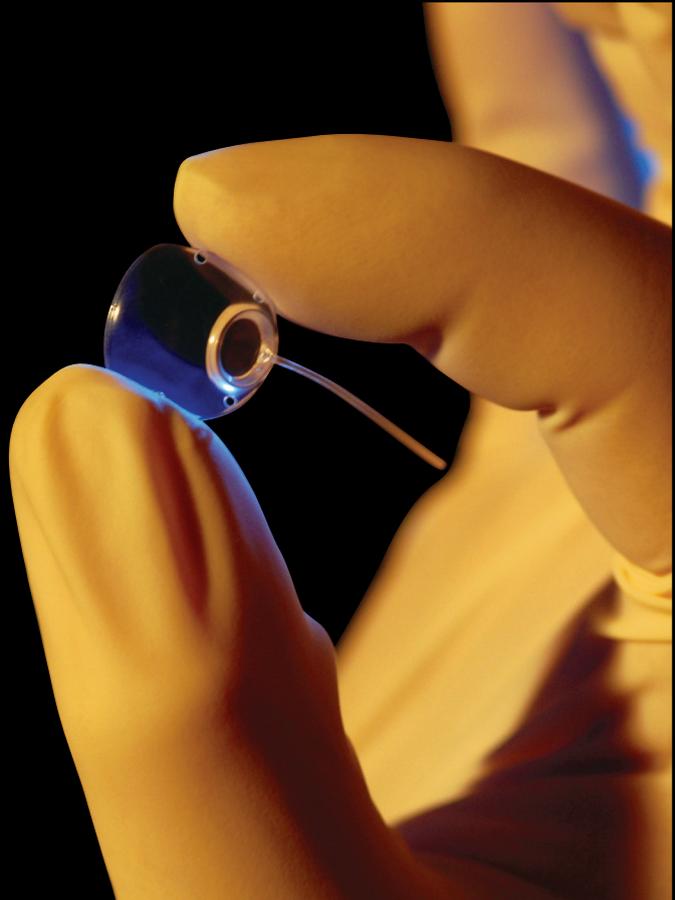
**Double plate
performance¹**

Single quadrant surgery

Unique primary drainage area

- Immediate or delayed drainage
- Enhanced 'biological valve'
- Staged bleb development
- Large, permeable bleb capsule

Excellent long-term control of IOP



Molteno[®] implants

- the only glaucoma drainage devices followed prospectively for over 35 years
- the long term solution for severe and complex glaucomas¹



CE 0344

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Molteno3® implant Development

The design of the **Molteno3** implant is based on the tube and plate principle pioneered by Professor Anthony Molteno in the 1970's and shown to be the most effective treatment for severe and complex cases of glaucoma that do not respond to hypotensive medication.

Molteno implants also provide better long-term control of intraocular pressure (IOP) in cases of primary open angle glaucoma when compared to trabeculectomy². Made from the same proven materials, **Molteno3** implants differ from earlier models in that they have a single, thinner, more flexible episcleral plate, the height of the outer ridge has been reduced, and the subsidiary ridge has been modified to form an elliptical primary drainage area. The upper surfaces of **Molteno3** implants are divided into a small primary drainage area (<25mm²) and a large secondary drainage area.

The Molteno3 design has major advantages:

Single quadrant surgery

Involving only one quadrant, the **Molteno3** implant sits snugly between and slightly beneath the adjacent extraocular muscles.

Immediate or Delayed drainage

Except when emergency IOP reduction is required, the implant tube should be occluded with an absorbable suture (eg 5.0 braided polyglactin). For cases requiring immediate drainage, a small modification to the surgical technique enhances the function of the 'Biological Valve' to reduce hypotony and optimise bleb structure.

Enhanced action of the 'Biological Valve'

The primary drainage area of the **Molteno3** implant, when covered by Tenon's tissue, forms a self cleaning 'biological valve' which resists blockage by cellular ingrowth, blood clot or cellular debris.

The 'biological valve' reduces hypotony by confining the aqueous to the small primary drainage area until the IOP rises¹.

Staged Bleb Development

At the onset of drainage, aqueous is restricted to the small primary drainage area (Fig 1.) Collagen is laid down in the overlying conjunctival

tissue, the IOP rises and apoptosis (a fibrodegenerative response) begins in the innermost layers of the primary bleb capsule. When the IOP rises further, the tissues lift off the primary drainage area and aqueous, containing pro-apoptotic factors, flows into the large secondary drainage area (Fig 2). Collagen deposition in the secondary drainage area is limited by the pro-apoptotic factors already present in the aqueous. A dynamic equilibrium between fibrotic deposition of collagen and apoptotic breakdown of collagen is established early in the secondary bleb capsule, resulting in a naturally thinner, robust, more permeable bleb capsule without the need for antimetabolites. Staged development of the bleb capsule leads to excellent control of IOP and less need for hypotensive medication over the long term^{3,4}.



Fig 1: Initial bleb formation

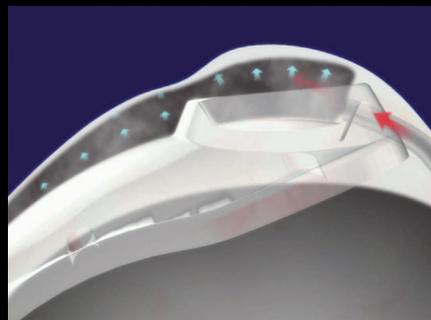


Fig 2: Final bleb function

Indications

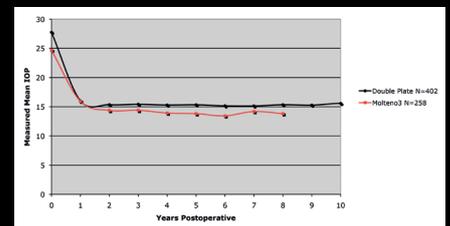
The **Molteno3** implant provides excellent results in all types of resistant glaucoma. **Molteno3** implants are recommended wherever hypotensive medication or conventional drainage surgery has failed or carries a poor prognosis, for example:

- Previous failed trabeculectomy, in either eye.
- Primary open angle glaucoma with additional risk factors such as field loss close to fixation point or pseudophakia
- Requires cataract extraction

- Active uveitis
- Juvenile glaucoma or buphthalmos
- Traumatic glaucoma
- Unable to cooperate with medication regimen
- Neovascular glaucoma

Results

Molteno3 implant results have been impressive. When the outcomes of all non-neovascular glaucoma cases implanted with the first **Molteno3** implants (n=258) were compared to cases who received **Molteno** double plate implants (n=402), the IOP was consistently lower in the **Molteno3** group. The results are summarised in the graph below.



Technical Information

Model	Diagram	Technical Specifications
GL-250		Surface area of plate = 230mm ² Maximum plate length = 16.0mm Maximum plate width = 15.0mm Plate thickness = 0.40mm Ridge Height = 0.75mm Tube Internal Diameter = 0.34mm Tube External Diameter = 0.64mm Translimbal Tube Length = 17.0mm
GS-175		Surface area of plate = 175mm ² Maximum plate length = 14.2mm Maximum plate width = 13.5mm Plate thickness = 0.40mm Ridge Height = 0.75mm Tube Internal Diameter = 0.34mm Tube External Diameter = 0.64mm Translimbal Tube Length = 19.0mm

References

1. Thompson AM, Molteno AC, Bevin TH, Herbison P. Otago glaucoma surgery outcome study: comparative results for the 175-mm² Molteno3 and double-plate Molteno implants. *JAMA Ophthalmol.* 2013 Feb;131(2):155-9.
2. Molteno AC, Bevin TH, Herbison P, Husni MA. Long-term results of primary trabeculectomies and Molteno implants for primary open-angle glaucoma. *Arch Ophthalmol.* 2011 Nov;129(11):1444-50.
3. Molteno AC, Fucik M, Dempster AG, Bevin TH. Otago Glaucoma Surgery Outcome Study: factors controlling capsule fibrosis around Molteno implants with histopathological correlation. *Ophthalmology.* 2003 Nov 1;110(11):2198-206.
4. Molteno AC, Thompson AM, Bevin TH, Dempster AG. Otago Glaucoma Surgery Outcome Study: tissue matrix breakdown by apoptotic cells in capsules surrounding Molteno implants. *Investigative ophthalmology & visual science.* 2009 Mar 1;50(3):1187-97.



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