Tidsskriftet Tidsskrift for Den norske legeforening

New improved treatment for glaucoma?

OPINIONS

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Minimally invasive glaucoma surgery is a long-awaited development, but more research is needed on the effectiveness and safety of these new surgical methods.

The prevalence of glaucoma in Norway is 1.4 % in total, and 8 % among those aged 70 and over (1). This is comparable to other diseases, such as heart failure (2). The number of glaucoma patients is expected to increase as the elderly population grows.

Glaucoma causes irreversible damage to the optic nerve, and treatment involves lowering of the eye pressure. Initially, this is typically managed with laser treatment or pressure-lowering eye drops (often several types), while surgery may become relevant at a later stage. Glaucoma is still a feared cause of blindness, including in Norway.

New treatment options

Various new glaucoma medications were introduced in the 1990s (3, 4). In the 20 years that followed, few advancements were made in treatment, other than the introduction of preservative-free eye drops.

In the last five years, however, considerable developments have been seen in glaucoma surgery (4).

For many years, trabeculectomy has been the most common method, which involves using surgical instruments to create a new drainage route for the aqueous humour outside the trabecular meshwork (4). However, this method is invasive and is associated with some risk of complications and lengthy postoperative follow-up. Nevertheless, it is a well-documented treatment with the potential for very good outcomes.

> ***«This method is invasive and is associated with some risk of complications and lengthy postoperative follow-up»***

In recent years, a number of new stents and shunts have been introduced that are implanted in the anterior part of the eye to drain the aqueous humour and lower the pressure. The generic term for this type of treatment is micro-

invasive/minimally invasive glaucoma surgery (MIGS). This new health technology has attracted a lot of attention and positive publicity. Clinical testing and documentation have, however, been limited, and in parallel with the publication of new clinical results, the euphoria has subsided slightly. However, MIGS still seems to have a place in glaucoma treatment and is potentially suitable for a wide range of patients. Extensive research is nevertheless needed, and long-term results over several years need to be examined and presented.

Clinical documentation

These new stents are typically made of metal (e.g. heparin-coated titanium) or a soft material (e.g. collagen) which is intended to be biocompatible. These are, nonetheless, a foreign body inside the eye, which in theory could affect nearby structures. However, this has not been sufficiently investigated for most types. One of the most promising stents was withdrawn from the market in 2018 after a study found increased cell loss in the corneal endothelial cell layer at the five-year follow-up (5). This shows the need for thorough safety assessments.

Under the auspices of the Norwegian Institute of Public Health, a health technology assessment (HTA) was performed in 2021. The conclusion in the HTA report was as follows (6): 'The clinical evidence on MIGS is limited. The main reason for this is the lack of comparative studies.' The HTA further found that these technologies 'may be cost-effective, depending on comparator and disease stage.'. The report predicts that the number of such procedures will double by 2024. We believe that the increase will be considerably higher.

The Preserflo MicroShunt (Santen) is one type of MIGS that is increasingly being used in Norway and other countries. It is made from a biocompatible synthetic polymer material and has shown promising results in the few long-term studies that have been conducted (7). The results of a recently published randomised multi-centre study also suggest that the stents are effective even when being compared to traditional glaucoma surgery (trabeculectomy) (8). In Norway, other types of stents have also been used, including the XEN gel stent and the iStent. Clinical documentation is limited for most types of MIGS and more studies are now needed.

> ***«Preliminary clinical experience and the limited data give reason for cautious optimism»***

There are strong indications that MIGS is here to stay. Preliminary clinical experience and the limited data give reason for cautious optimism. We believe that MIGS has the potential to make a marked change in the treatment options for this patient group. The cost per stent is high, but cost-effectiveness will depend on the long-term effectiveness, the need for postoperative follow-up and additional surgery, and the proportion of patients who manage without

glaucoma medication. More research and quality improvement studies will provide a better basis for assessing effectiveness and safety, and for drawing up guidelines for glaucoma treatment – which must also include MIGS.

REFERENCES

1. Slettedal JK, Traustadóttir VD, Sandvik L et al. The prevalence and incidence of glaucoma in Norway 2004-2018: A nationwide population-based study. PLoS One 2020; 15: e0242786. [PubMed][CrossRef]

2. McDonagh TA, Metra M, Adamo M et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. Eur Heart J 2021; 42: 3599–726. [PubMed][CrossRef]

3. Realini T. A history of glaucoma pharmacology. Optom Vis Sci 2011; 88: 36–8. [PubMed][CrossRef]

4. Stein JD, Khawaja AP, Weizer JS. Glaucoma in Adults-Screening, Diagnosis, and Management: A Review. JAMA 2021; 325: 164–74. [PubMed] [CrossRef]

5. Reiss G, Clifford B, Vold S et al. Safety and Effectiveness of CyPass Supraciliary Micro-Stent in Primary Open-Angle Glaucoma: 5-Year Results from the COMPASS XT Study. Am J Ophthalmol 2019; 208: 219–25. [PubMed][CrossRef]

6. Folkehelseinstituttet. Minimal-invasiv glaukomkirurgi (MIGS) for individer med glaukom. En metodevurdering. https://www.fhi.no/publ/2021/minimal-invasiv-glaukomkirurgi-migs-for-individer-med-glaukom/ Accessed 15.3. 2022.

7. Batlle JF, Corona A, Albuquerque R. Long-term Results of the PRESERFLO MicroShunt in Patients With Primary Open-angle Glaucoma From a Single-center Nonrandomized Study. J Glaucoma 2021; 30: 281–6. [PubMed][CrossRef]

8. Baker ND, Barnebey HS, Moster MR et al. Ab-Externo MicroShunt versus Trabeculectomy in Primary Open-Angle Glaucoma: One-Year Results from a 2-Year Randomized, Multicenter Study. Ophthalmology 2021; 128: 1710–21. [PubMed][CrossRef]

Publisert: 2. May 2022. Tidsskr Nor Legeforen. DOI: 10.4045/tidsskr.22.0058
Received 19.1.2022, accepted 15.3.2022.