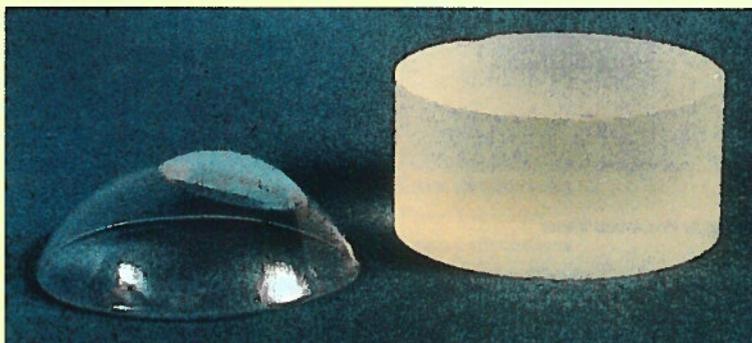


Advanced contact lens fitting

Part five

The scleral contact lens: clinical indications

Figure 1
Scleral lens and button



In the fifth article in our series on advanced contact lens fitting, Esther-Simone Visser discusses the role of scleral lenses in modern contact lens practice

The use of scleral lenses has diminished with the advent of corneal and hydrogel contact lenses. Those with certain ocular disorders, however, cannot be adequately fitted with corneal contact lenses and for these cases a scleral lens may be indicated and can often be fitted successfully. This article provides a review of current indications for the use of scleral lenses, and is based upon a survey of the literature, complemented by clinical experience at the Visser Contact Lens Practice in Nijmegen, the Netherlands.

The clinical application of contact lenses began with the work of Fick and Muller in the 1880s.¹ Early contact lenses were all haptic or scleral and made out of glass.² A preformed trial fitting set started to develop in 1920-30, followed by the introduction of plastics by Feinbloom.³ Later, the development of scleral lenses stagnated because of the introduction of corneal and hydrogel lenses. These lenses were much easier to fit and led to fewer contact lens-related complications which resulted from the hypoxia induced by scleral lenses at that time. However, because of the therapeutic value of sclerals, Ezekiel evaluated the use of these lenses in a gas permeable material (Boston II, a siloxanyl/acrylate polymer) in 1983. He reported a greater acceptability and comfort of the lens for all the patients he fitted, in addition to the reduction in

the adaptation time required for a comfortable fitting compared to PMMA lenses.² Because of the low oxygen transmissibility of the material used in his trial ($Dk = 14.8 \times 10^{-11} \text{ cm}^2 \text{ ml O}_2/\text{sec ml mmHg at } 35^\circ\text{C}$), a fenestration in the lens was still necessary to supply enough oxygen to the corneal surface. After higher oxygen permeable materials were developed, reports by Schein, Rosenthal, Ducharme, Kok and Visser showed that totally sealed lenses in a higher oxygen permeable material (Equa material, a fluoro-silicone/acrylate copolymer with a Dk of $110 \times 10^{-11} \text{ cm}^2 \text{ ml O}_2/\text{sec ml mmHg at } 35^\circ\text{C}$) could be fitted successfully.^{3,4,5} Following a survey of 118 eyes in 85 patients, Tan, Pullum and Buckley concluded that gas-permeable scleral lenses are a safe and effective treatment modality to consider in the management of corneal disease.⁶

Fundamentals of scleral lens fitting

In modern scleral lens clinical practice, there are essentially two fitting principles: the impression technique and the preformed technique.⁷ Impressions are still necessary in extreme cases when the sclera is excessively toric or irregular.⁸ In our practice we mainly perform the preformed fitting technique, because lenses can be manufactured in higher Dk materials and it is possible to develop a standardised fitting procedure. ►

This is the fifth in a series of continuing education articles reviewing advanced contact lens fitting techniques compiled by series editor Dr Philip Morgan