Lens file: SynergEyes Duette

Continuing our series looking at specialist contact lens designs, **Caroline Burnett Hodd** describes the Duette hybrid lens that combines a high Dk RGP centre with a silicone hydrogel skirt

For patients with moderate to high astigmatism there are certainly more lens choices out there than ever before but are we actually offering our patients the best?

For most of us a soft lens is our lens of first choice due to the fact that it is relatively easy to fit and is usually immediately comfortable. However, for the patient to see well a soft toric lens needs to sit in exactly the right position and not rotate much on blinking – if it does not conform then fitting becomes frustrating for both us and for the patient.

In the past, patients with significant astigmatism would have been fitted with rigid lenses, as rigid lenses correct corneal astigmatism directly due to the nature of the tear lens. However, rigid lenses have an uncomfortable adaptation period, which can be unpleasant for the patient.

What would be ideal is a lens that offers the vision of a rigid lens with comfort more like a soft lens and this is the philosophy behind a hybrid lens. Hybrid lenses have a rigid portion in the centre (giving the vision of a rigid lens) bonded to a soft skirt (for improved comfort).

Previous generations of hybrid lenses include the Softperm and SynergEyes designs. The Softperm lens suffered from the fact that it had an extremely low Dk leading to neovascularisation. The SynergEyes A has a far greater central Dk value but still has a low Dk skirt and is, perhaps, not the easiest lens to fit.

The newest generation of hybrid lens, the SynergEyes Duette (Figure 1), has an extremely high central Dk and a silicone hydrogel skirt. In addition it has an extremely simple fitting philosophy that allows the patient to be fitted in a similar time to a soft toric lens.

Perfect candidates for the Duette are those with moderate to high corneal astigmatism, those who are soft lens dropouts, sports people and anyone wanting the crisp vision of an RGP. The Duette lens is available from No7.

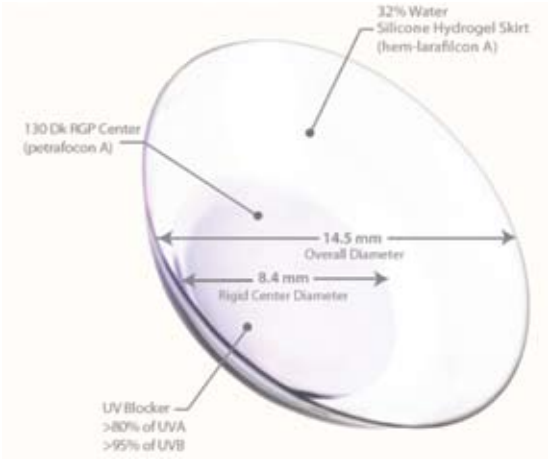

Figure 1 SynergEyes Duette parameters

Figure 2 The Duette fitting set contains 15 lenses. There are five different base curves, each with a flat, medium and steep skirt

TABLE 1
SynergEyes Duette parameters

RGP centre	Petrafilcon A, Dk 130
Soft skirt	hem-larafilcon A, 32% water Dk 84
Total diameter	14.5mm
RGP diameter	8.4mm
Base curve	7.1, 7.3, 7.5, 7.7, 7.9mm
Skirt curve	Steep, medium or flat
UV Blocker	>80% of UVA, >95% of UVB

Parameters

The Duette lens has a total diameter of 14.5mm with a 8.4mm rigid centre (Table 1). The Dk of the RGP portion is 130 while the soft skirt has a Dk of 84 and a surprising low modulus of 0.6. The lens has UV protection blocking greater than 80 per cent of UVA and greater than 95 per cent of UVB, and both the centre and skirt have excellent wetting properties.

The lens is available with base curves from 7.1 to 7.9mm in 0.2 steps. This may seem a small range but, due to the way the lens is fitted, this will cover the majority of normal eyes. Each base curve is then available with three different skirts – steep, medium and flat – and it is actually the skirt that is most important in the fit by increasing or decreasing the sagittal depth of the lens.

The power range is from +6.00 to -8.00D in 0.25D steps and to -15.00D in 0.50D steps, and the lens is licensed to correct up to 6D of corneal astigmatism.

The replacement schedule is six-monthly due to the silicone hydrogel skirt.

Lens selection

The great advantage of the Duette lens over previous hybrid lenses is its simple fitting strategy. The fitting philosophy is to fit the lens so that the RGP part generally conforms to the shape of the cornea but just clears it. It is changes to the skirt of the lens that are used to alter the depth of the lens to increase or decrease this clearance, so in effect we are fitting the sagittal depth of the eye.

Unfortunately this depth is not predictable from central keratometry values – hence the Duette cannot be fitted empirically and a fitting set is required.

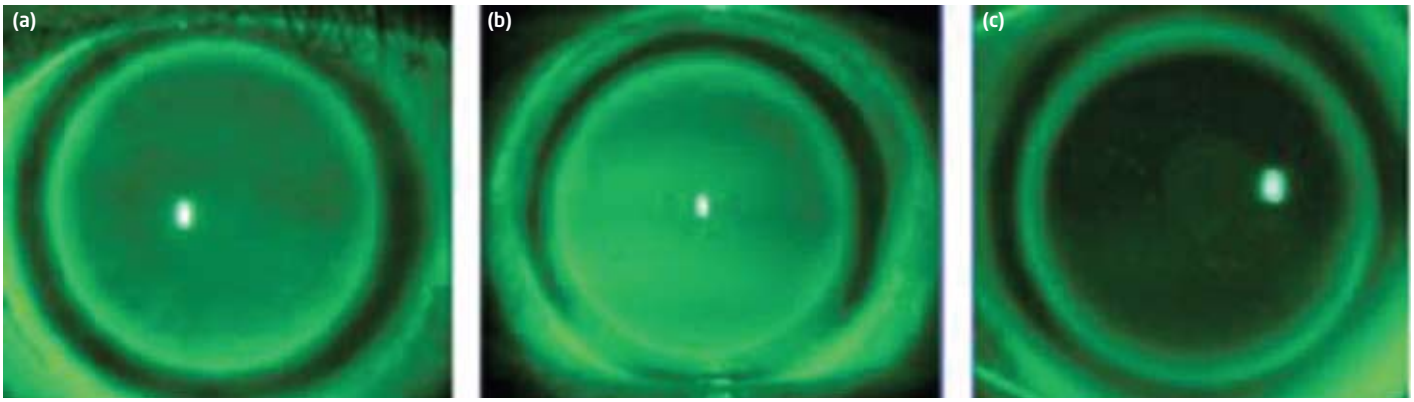

Figure 3 Duette fits (a) the ideal fit; (b) a steep fit; (c) a flat fit. The optimum lens care system to recommend is hydrogen peroxide

TABLE 2
Selecting the correct Duette base curve from flattest K

Flattest keratometry value (mm)	Duette base curve (mm)
8.20 to 8.05	7.90
8.00 to 7.85	7.70
7.80 to 7.65	7.50
7.60 to 7.45	7.30
7.40 to 7.20	7.10

Base curve

The fitting set comes with 15 lenses (Figure 2). Each of the base curves – 7.1, 7.3, 7.5, 7.7 and 7.9mm – are present with a flat, medium and steep skirt. The steep skirt provides the greatest sagittal depth, while the flat skirt offers the lowest sagittal depth and the medium is in between.

To select the first trial lens, the patient's flattest K is used to select the correct base curve from a table provided with the fitting set (Table 2); in effect the lens is fitted around 0.2mm steeper than flattest K.

Skirt curve

Once the base curve has been selected then there are only three lenses to choose from: the flat, the medium and the steep skirt. For example, if the flattest K is 7.9mm, then the correct base curve would be 7.7mm giving three choices of lens: either the 7.7mm flat skirt, the 7.7mm medium skirt or the 7.7mm steep skirt. Having only three possible choices is a great advantage as it speeds the fitting process up significantly.

As most normal eyes have similar corneal curvatures it is possible to speed up the fitting process even more by applying the medium skirt lens to one eye and the steep skirt to the other, allowing a quick comparison of the two. If the patient has markedly different eyes, apply the medium skirt of the appropriate base curve to each.

Insertion

The lens is applied filled with saline with normal sodium fluorescein added to the filled lens with the patient looking down and the lens brought from below (for more on insertion and removal see the previous article on SynergEyes[1]). It is important to assess the lens fit within 3-5 minutes of application before the fluorescein is lost; this again speeds up the fitting process. A Wratten filter is required to assess the fit effectively.

Assessing fit

Fluorescein pattern

Figure 3a shows the ideal fit for the Duette lens. It should look familiar to the reader as it looks very much like a good or maybe slightly steep fit for an RGP lens; there should be a touch of fluorescence under the lens and what looks like a clear band of edge lift. This is the junction of the RGP part to the soft skirt. If the fit looks like this then this is the correct skirt for the lens and the patient should report that the lens feels pretty comfortable.

Figure 3b shows a steep fitting lens. In this case there is a lot of fluorescein beneath the lens; it is easy to spot a steep lens as the large amount of fluorescein obscures the band of edge lift. In this case a lens with a lower skirt is required. The patient may also report that they can feel the lens under their top lid.

Figure 3c shows a flat-fitting lens. There is no fluorescein under the RGP part of the lens and the patient may report that the lens is a little uncomfortable centrally. For the ideal fit, the lens should move on push-up but may not move as much as a soft lens on excursions.

If the two eyes are similar then if, for instance, the steep skirt lens looks steep and the medium skirt lens looks perfect then pick the medium skirt for both eyes. If both the medium and steep skirted lenses look steep then remove the steep skirt lens and apply the flat skirt to see if this looks more like the ideal fit. This whole process takes around 10 minutes.

Over-refraction

Once the correct skirt has been selected then perform an over-refraction over the lens. The over-refraction should be spherical; if there is a toric component then unfortunately there is lenticular astigmatism and a soft toric may be a better option. The over-refraction should be added to the -3.00D of the diagnostic lens to obtain the required power to order.

The final lenses should have very good comfort and considering that the patient is effectively wearing an RGP lens this is an amazing feat. If there is any lens sensation the patient will lose this within a couple of weeks of wear.

Conclusions

There are still many situations where soft lenses should be our first choice lens but we may be letting down our patients with moderate to high amounts of corneal astigmatism by not giving them the chance to see what their vision could be like with a rigid lens.

The Duette gives us this opportunity by offering the vision of a rigid lens with the comfort of a soft.

The lens is as quick, and possibly even easier, to fit than a soft toric and it is made from materials that offer excellent oxygen transmissibility and are healthy for the eye.

Reference

1 Taylor-West S. Lens File: SynergEyes. *Optician* 2009;238:6231 26-28.

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