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2014 (67)

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Report
- EFCLIN Congress & Exhibition
- EFCLIN: Manufacturers’ Forum
- Revisiting Vietnam

Fitting Background
- Backstage – Part 2
- Measuring the cornea and beyond with the ESP

Technology
- Ortho-K
- Evaluation of a new hybrid contact lens

International News
- Is Allergan next for a Valeant takeover?

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LETTER FROM THE PUBLISHER
3 No manners!
Jörg Spangemacher

REPORT
6 EFCLIN Congress & Exhibition
Silke Sage
10 EFCLIN: Manufacturers’ Forum
Erik Larsen
38 Revisiting Vietnam
Wim Aalbers
40 NCC 2014: The secret of success
Silke Sage

TECHNOLOGY
14 Evaluation of a new hybrid contact lens
Dr. Marie Delfour Malecaze
28 Ortho-K
Martin Conway

HISTORY
18 The first soft contact lenses
Dr. Hans-Walter Roth

BUSINESS AND MARKETING
34 Avoiding the fluctuation of qualified staff
Rolf Leicher

FITTING BACKGROUND
20 Backstage – Part 2
Eef van der Worp
24 Measuring the cornea and beyond with the ESP
Arnoud Sneepvangers

IOL
32 Re-examining the value proposition for hydrophobic IOL manufacturing
Patrick Benz

INTERNATIONAL NEWS
27 Column
Eef van der Worp
42 Is Allergan next for a Valeant takeover?
Tom Baugh
44 CLMA
Silke Sage
45 Spotlights
47 Industry News
48 Yellow Pages
49 Conferences & Trade Fairs
50 Closing Words – Laurent Malfaire
50 Masthead
Evaluation of a new hybrid contact lens

Today, ophthalmologists dispose two types of contact lenses: frequent replacement soft contact lenses for simple ametropia, and the less often used traditional rigid lenses (RGP) for more complex ametropia.

A new alternative is now available with the introduction of new hybrid contact lenses, disposing of a rigid gas permeable central zone and a soft peripheral skirt made of a silicone hydrogel material, and intended for quarterly replacement. This new concept is attractive, but what can we expect from this new category of lenses and who can benefit from them?

By Dr. Marie Delfour Malecaye

To answer those questions, a study has been conducted by a group of ophthalmologists in order to evaluate new hybrid contact lens EyeBrid silicone, developed and commercialized by French contact lens laboratory LCS.

OBJECTIVE

16 Ophthalmologists realised a prospective study to determine the precise indications of the EyeBrid silicone hybrid contact lens and to evaluate its performance, from the point of view of both the patient (comfort, lens handling and visual acuity) and the practitioner (overall satisfaction and percentage of prescription). As a secondary objective, the number of trial lenses was measured.

METHODOLOGY

The prospective study was conducted in France. 16 ophthalmologists specialized in contact lenses participated in the study between December 2013 and March 2014. A total of 156 patients were enrolled.

Each doctor was asked to fill out a questionnaire for each patient, being either a new or existing contact lens wearer, to whom the specialist proposed the new hybrid lens.

Fig. 1<sup>st</sup>: The distribution of ametropia
The protocol included a classic eye examination to determine the ametropia of the patient, the type of lenses worn in the case of refits and the indication based on keratometric measurements. The EyeBrid silicone lenses were then ordered from the laboratory, fitted and then evaluated by the ophthalmologist until the fit was satisfactory. The number of trial lenses had to be listed and several subjective criteria were evaluated on a scale from 1 to 5 (1 being unsatisfactory and 5 excellent) including habituation, visual acuity, lens handling (insertion and removal), comfort throughout the day and overall satisfaction. Then the practitioner marked his/her overall satisfaction (with the same scale of 1 to 5) and whether or not EyeBrid silicone lenses were prescribed. All side effects also had to be noted.

The data of 156 patients were registered in a database and analysed by Fovéa10. All variables (quantitative variables: number of data provided and missing, average, standard deviation, median, minimum maximum, confidence interval at 95% ; qualitative variables: percentages) were also analyzed by sub-group (refits vs. new wearers, wearers of soft contact lenses vs. wearers of RGP's, high myopia vs. astigmatism, post-surgery and keratoconus) in order to determine possible success factors.

RESULTS

ANALYSIS OF THE POPULATION AND INDICATIONS

156 patients were enrolled in this study, with a majority of refits (73.20%) against 26.80% of new wearers (figure 1).

Figure 1 illustrates the distribution of ametropia with a majority of keratoconus and high myopia.

ANALYSIS OF THE SATISFACTION OF WEARERS FOR THE TOTAL POPULATION OF 156 PATIENTS

Analysis shows that the performance of the EyeBrid silicone lens is very good with an average score of 3.95. The marks allocated to each of the criteria measured were very homogenous (between 3.6 and 4.2). There wasn’t any significant difference amongst the marks, whether it be the subjective ratings of the wearers or the final mark given by the investigators. The highest rated criterion is visual acuity, even though there’s no significant difference (figure 2).

The investigators were very satisfied and prescribed the hybrid lens in 71% of all cases. They used an average of 1.47 trial lenses per eye for the patients successfully fitted with these lenses.

The same type of analysis was also carried out for each of the
subgroups, enabling to compare: refits vs. new wearers (figure 3), keratoconus vs. astigmatism vs. high myopia (figure 4) and wearers of RGP lenses vs. wearers of soft lenses (figure 5).

The results of the refits and new wearers subgroups were good and homogeneous independent of the former equipment. However, EyeBrid silicone performed better on patients who were refitted with these lenses. Refits have a better success rate (75% prescription rate) and score better on habituation, comfort, visual acuity, ease of insertion and overall satisfaction (figure 3).

The success rate was also better for patients suffering from keratoconus (82% prescription rate). This population preferred these hybrid lenses for their visual acuity and ease of habituation. Overall satisfaction was very good as well, and those results are significant (figure 4).

Keratoconus (N=89) / Spherical ametropias (N=33) / Astigmatism (N=17)

The success rate was much higher for the group of former wearers of RGP lenses (80% prescription rate) as compared to the former wearers of soft lenses (55% prescription rate). The results for both subgroups are homogeneous without any significant difference amongst the different criteria (figure 5).

RGP lenses (N=79) / Soft lenses (N=22)

**DISCUSSION**

This study shows that the main indications of these lenses are the same as those of RGP lenses, being complex ametropia (high myopia, high astigmatism, keratoconus and post-surgery). This study also shows that these lenses have a very high success rate with an overall prescription rate of 71%. Results are homogeneous and the lens performs very well, both from the point of view of the patients (for their comfort, visual acuity and lens handling) and practitioners (for their ease of fitting). Success rates were even higher for wearers of RGP lenses refitted with EyeBrid silicone lenses and for patients suffering from keratoconus. The success rate was less for former wearers of soft lenses. The ophthalmologists also greatly appreciated the easy fitting process. Only 1.47 lenses were used to successfully fit a patient, even on very complex cases like advanced stage and decentralized...
keratoconus. The short habituation period of these lenses enable to speed up the fitting process as compared to the fitting of rigid lenses.

CONCLUSION AND PROSPECTS

In the years to come, hybrid lenses will probably become 1st intention lenses for the correction of ametropia not covered by frequent replacement soft lenses. They will also be very useful for refitting wearers of RGPs lacking of comfort as well as abandoners. Schlanger\(^6\) was one of the first to study the population of abandoners. The main reasons that make wearers decide to abandon their lenses are discomfort (72%) and visual acuity problems (20%). Convenience and price are of minor importance (8%). Young made the same observations in England in 2002\(^7\) where he studied a population of 236 abandoners. The Sofres study conducted by the Syfloc in 2001\(^8\) showed similar results in France. These three studies also reveal that those abandoners who accepted to give it another try were successfully refitted with new lenses in 82% of all cases\(^8\).

The performance of EyeBrid silicone lenses will now have to be evaluated in the long term. A new study may be conducted after six months or one year of wear, but we can already say that this new category of hybrid lenses offers new indications and prospects to wearers. EyeBrid silicone enables us to go beyond the current fitting limits and has already become an essential and indispensable tool of our fitting process.

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