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Evaluation of Bandage Contact Lenses Following Refractive or Therapeutic Procedures

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PURPOSE

To better understand how bandage contact lenses (BCLs) are evaluated in clinical research studies following refractive procedures, such as Laser Assisted Sub-Epithelial Keratectomy (LASEK) and Photorefractive Keratectomy (PRK); or after a therapeutic treatment, such as Corneal Collagen Crosslinking (CCXL) for Keratoconus.

METHODS

A series of detailed literature searches were performed in PubMed (using keywords, such as “PRK”, “LASEK” and “Corneal Collagen Crosslinking”) to identify published research studies conducted in human patients that had undergone either CCXL for keratoconus, or LASEK/PRK within the last 10 years (2005-2015).

Exclusion criteria were set to remove studies that had used a transepithelial CCXL procedure, that were performed in non-human eyes, or included cases of iatrogenic keratectasia. Additionally, papers not written in English were also excluded.

After applying the exclusion criteria, a total of 73 papers were carefully scrutinised to explore the following criteria: 1) Were the fitted BCLs named within each study? If so, what materials were these BCLs made from? 2) Was deposition on the BCLs monitored? 3) Was epithelial healing evaluated? If so, which methods of evaluation were used? 4) Was post-treatment pain, whilst wearing the BCLs, evaluated? If so, which methods of evaluation were used?

RESULTS

A large proportion (31/73: Fig. 1) of these published reports did **not** disclose which brand of BCLs were fitted following these refractive/therapeutic procedures. A majority of studies (27/42) reported fitting at least one of the current three US Food and Drug Administration (FDA)-approved BCLs (Figs. 2 & 3). Surprisingly, very few studies reported the assessment of either BCL deposition (4/73: Fig. 4) or epithelial healing (15/73: Figs. 5 & 6). Of the studies that evaluated post-treatment pain whilst wearing BCLs (25/73: Fig. 7), the most common grading method involved the use of a numerical rating scale (13/25: Fig. 8). Whilst some authors did not disclose when the BCLs were removed post-treatment (10/73: Fig. 9), a majority of studies reported that removal occurred following complete re-epithelialisation (36/73: Fig. 9). The remaining studies (27/73: Fig. 9) reported that BCLs were removed after a specific number of days following treatment.

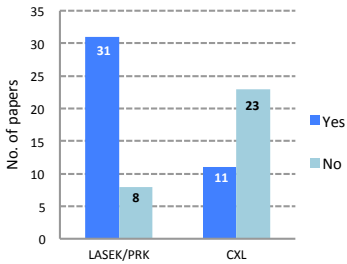


Fig.1 A summary of the no. of papers which disclosed/did not disclose the brand of BCLs fitted

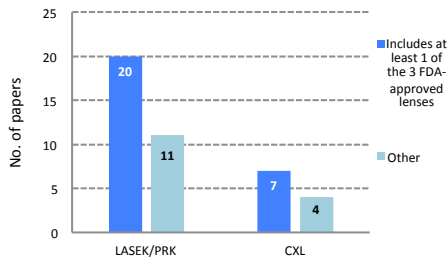


Fig.2 A summary of the BCLs used in various studies

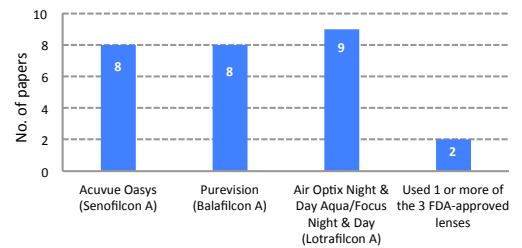


Fig.3 A breakdown of the FDA-approved BCLs used in various studies

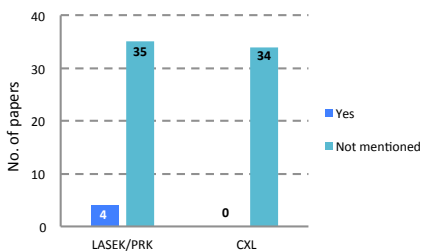


Fig.4 A summary of the no. of papers which disclosed/did not disclose the evaluation of BCL deposition

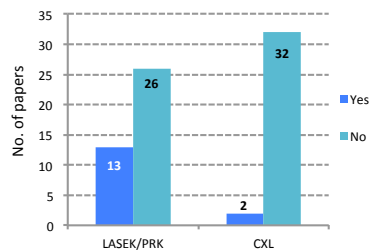


Fig.5 A summary of the no. of papers which disclosed/did not disclose the evaluation of epithelial healing

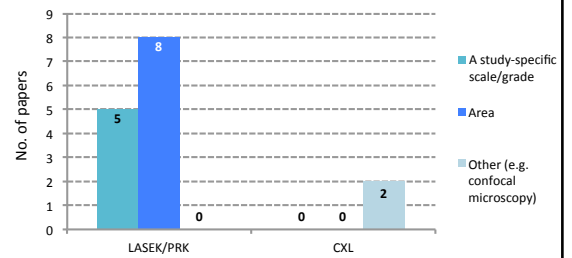


Fig.6 A breakdown of the methods used to evaluate epithelial healing in various studies

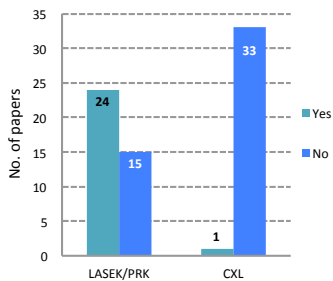


Fig.7 A summary of the no. of papers which disclosed/did not disclose the evaluation of pain with BCLs in-situ

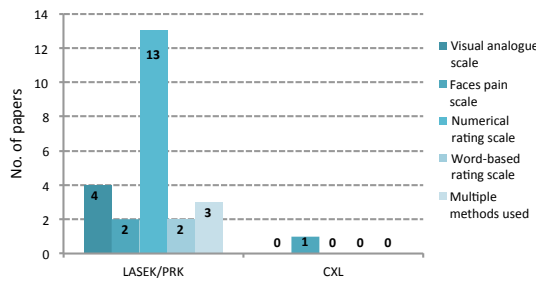


Fig.8 A breakdown of the different methods used to evaluate pain with BCLs in-situ across various studies

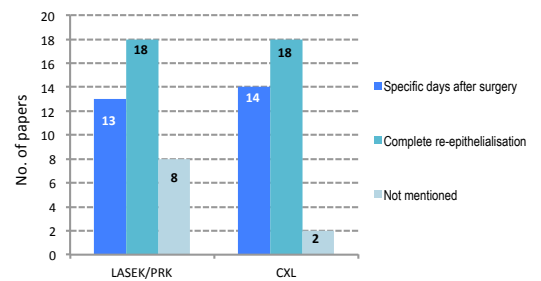


Fig.9 A breakdown of when the BCLs were typically removed following treatment

CONCLUSION

Currently, there is little consensus in the published literature regarding how BCLs should be evaluated when fitted to patients following either CCXL for keratoconus, or LASEK/PRK. Further research needs to be conducted to develop an accepted protocol of assessments, which might include monitoring of BCL deposition, a recognised method of assessing epithelial healing and evaluation of post-treatment pain whilst wearing BCLs. These factors are all important in determining whether a BCL should be left in-situ, replaced for a fresh BCL or removed altogether. A more harmonious approach to evaluating the performance of BCLs, following either refractive or therapeutic procedures, would prove useful in delivering a higher standard of patient care.

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