

Wound integrity of clear corneal incisions closed with fibrin and N-butyl-2-cyanoacrylate adhesives.

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Abstract:

PURPOSE: To compare the integrity of clear corneal incisions closed with fibrin (Tisseel) and n-butyl-2-cyanoacrylate (Histoacryl) tissue adhesives to those closed with conventional sutures.

METHODS: Four replicate experiments were performed on porcine eyes with each of the following conditions: three limbal clear corneal incision sizes (3.0 mm, 4.5 mm, and 6.0 mm), three incision closure techniques (fibrin adhesive, n-butyl-2-cyanoacrylate adhesive, and 10-0 interrupted nylon sutures)-1, 2, and 3 sutures at the 3.0-mm, 4.5-mm, and 6.0-mm incision sizes, respectively. Wound integrity was then measured by elevating the intraocular pressure of the eye to the point where wound leakage (IOP(L)) occurred. Two-way repeated measures analysis of variance (ANOVA) was used to analyze the IOP(L) data.

RESULTS: Incision closure technique and incision size showed significant interaction in the ANOVA model ($p = 0.0008$). Fibrin adhesive demonstrated higher IOP(L) compared to suture closure at the 3.0-mm incision size ($p < 0.0001$). There was no significant difference in IOP(L) when comparing wound closure with fibrin adhesive and sutures at the 4.5-mm and 6.0-mm incision sizes ($p = 0.52$ and $p = 0.56$, respectively). There was no significant difference between the three closure techniques for the 6.0-mm incisions ($p > 0.15$). When comparing the wound closure techniques for all incision sizes, the mean IOP(L) significantly increased in the following order: suture(s), fibrin adhesive, n-butyl-2-cyanoacrylate glue.

CONCLUSIONS: Fibrin or n-butyl-2-cyanoacrylate tissue adhesive may be used as a more stable alternative to conventional sutures in the closure of clear corneal incisions.