Comparison of Outcomes of 3-Snip Punctoplasty Versus Simple Punctal Dilatation With Monocanalicular Intubation for Acquired Punctal Stenosis

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Original Investigation

Purpose: To evaluate and compare the outcomes of invasive (rectangular 3-snip punctoplasty) versus minimally invasive (punctal dilatation with monocanalicular intubation) treatment modalities for the management of acquired punctal stenosis.

Methods: A retrospective, comparative, interventional case series was performed on 60 eyes of 36 patients with acquired punctal stenosis. Patients were categorized in 2 groups based on the intervention as 3-snip punctoplasty (group A) and punctal dilatation with monocanalicular intubation (group B). Qualitative and quantitative assessment for epiphora and punctal stenosis grading were performed preoperatively and postoperatively. Patients with associated canaliculal and nasolacrimal duct obstructions, congenital punctal disorders, eyelid malpositions, and less than 6 months’ follow up were excluded. Anatomical and functional successes were recorded following stent extubation and at 6-month follow up. Statistical analyses were performed using the chi-square, Fisher exact, and the Mann–Whitney tests. A p value of <0.05 was considered significant.

Results: Ninety-nine puncta of 62 eyes of 36 patients were analyzed. Mean age at presentation was 49 and 50 years in groups A and B, respectively. Bilaterality was noted in 67% (24/36) of the patients. Epiphora was the most common presentation. Involvement of upper punctum was noted in 6% (4/62), lower punctum in 34% (21/62), and both in 60% (35/62) of eyes. At 6-month follow up, the anatomical success rate was 84% (47 out of 56 puncta) in group A, whereas 93% (40 out of 43 puncta) in group B (p = 0.29). At 6-month follow up, restenosis occurred in more number of puncta (n = 9) in group A and only in 3 puncta in group B; however, this was not statistically significant (p = 0.21). No stent-related complications were noted.

Conclusion: Punctal dilatation with monocanalicular intubation achieves comparable outcomes as that of 3-snip punctoplasty in patients with acquired punctal stenosis.

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Punctal stenosis is a common lacrimal drainage disorder, and various modalities employed for its management include

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RESULTS

Ninety-nine puncta of 62 eyes of 36 patients satisfied the inclusion criteria. Table presents an overview of demographics, clinical presentations, and outcomes with their statistical significance values. Bilaterality was noted in 67% (24/36) of the patients. Involvement of upper punctum was noted in 6% (4/62), lower punctum in 34% (21/62), and both in 60% (37/62) of eyes. Epiphora was the most common presenting complaint noted in 100% (60/60) of eyes. The median Munk score for epiphora was 4 in both the groups. All patients recruited in this study had been diagnosed with grade 1 (severe) or grade 2 (moderate) punctal stenosis (Table), and all the diseased puncta were treated.

Group A had 34 eyes (18 patients with 56 puncta), while group B had 28 eyes (18 patients with 43 puncta). Groups A and B were similar when compared for patient-related factors, associated clinical features, and grades of punctal stenosis (Table). Anatomical success could be determined for individual puncta and, hence, were defined using the number of puncta as denominator, and for the functional success (resolution of epiphora), number of eyes were used as denominator. At 6-month follow up, anatomical success or attainment of grade 3 punctum was achieved in 84% (47/56) of puncta in group A and 93% (40/43) in group B, which was comparable and statistically not significant (p = 0.29). At 6-month follow up, restenosis occurred in more number of puncta (n = 9) in group A and in only 3 puncta in group B; however, this was not statistically significant (p = 0.21).

Post-operatively, median Munk score showed significant improvement in comparison to pre-op values in both the groups (p < 0.001); however, there was no statistical significance when the outcomes were compared between the groups A and B (p = 0.13). Functional success was noted in 70% (24/34) eyes in group A and 86% (24/28) eyes in group B, although this failed to reach a statistical significance (p = 0.14).

DISCUSSION

The current study showed that a simple punctal dilatation with MCI provides comparable outcomes as compared with rectangular 3-snip punctoplasty. The restenosis was less frequent, and functional success was higher for the punctal dilatation with MCI group, but the differences were not statistically significant.

Surgical principle of punctoplasty is to achieve an adequately sized functioning lacrimal punctum with an apposition to tear lake. One-snip punctoplasty, introduced a millennia back, could not become an ideal procedure in lieu of increased restenosis rates due to re-approximation of cut ends.1 Subsequently, modifications were introduced in the form of 2 snips and postoperative amputectomy, which was popularized to the modern 3-snip by Thomas et al.25,26 Perforated punctal plugs were also used subsequently in the management of punctal stenosis. Largest retrospective series of 169 patients reported anatomical success rates of 91% and 94% with 2- and 3-snip punctoplasty, respectively, at a mean follow up of 23 weeks.2 Functional success of merely 64% was noted in their series despite anatomically patent system, which was ascribed to Nasolacrimal duct stenosis, eyelid laxity, and chronic blepharitis. Caesar and McNab1 studied 53 patients who underwent 3-snip punctoplasty and noted functional success in 92% of the patients; however, postoperative epiphora evaluation was performed at only 1 week and duration of follow up was not specified. Presently, the most commonly used invasive technique is triangular or rectangular 3-snip punctoplasty. Chak and Irvine9 in 2009 found the rectangular punctoplasty to be a simple, safe, and quick procedure that maintains the normal anatomy and physiology of the canalicular system better than triangular punctoplasty. Ali et al4 supported this in their series of 87 eyes, where 82% of cases demonstrated complete resolution of symptoms post-rectangular punctoplasty. Hughes and Maria11 used a punch to perform posterior amputectomy, which was later popularized by Edelstein and Reiss,12 with resultant anatomical success in 95% and functional success in 92%; however, no standardized scale/grading were used for quantification of epiphora. Functional success of Kelly’s Descemet punch was shown by Wong et al in 92% cases, which is easy to perform and less invasive than a 3-snip punctoplasty.13 However, vertical and a small part of horizontal canalculus gets excised in punching and, thus, has the potential to disrupt the normal punctal anatomy.

In an attempt to prevent restenosis, intubation with mini-monoka post 1-snip punctoplasty achieved functional success of 85% and anatomical success of 96% but with associated increased rates of stent protrusion (9.4%).15 It is possible that widened punctum post snip fails to retain the collarette of Monoka with this particular technique. In the current series, good anatomical and
functional outcomes were noted with a simple punctal dilatation and monoka stents and, hence, obviates the need for additional 1-snip punctoplasty prior to Monoka insertion, making it more minimally invasive procedure and simultaneously preserving the punctal anatomy. Mini-Monoka could be easily inserted in all cases with no noted premature stent loss. Another added advantage with intubation lies in addressing canalicular stenosis as well, given the high rates of associated canalicular disorders in patients with acquired punctal stenosis. Chalvatzis et al prospectively compared the 3-snip punctoplasty with self-linking bicanalicular stents to punctoplasty alone, with former faring well in terms of anatomical (81% vs. 31%) and functional (62% vs. 18%) success.

Physiologic role of lacrimal punctum in tear drainage lies in maintaining positive pressure within horizontal canaliculus during eyelid closure and negative pressure during eyelid opening. Invasive procedures by means of ampullectomy and canalicular incision leave the system open to atmospheric pressure, disrupting the normal physiological mechanism. Capillary action of lacrimal canaliculus gets disrupted following ampullectomy. Simple punctal dilatation with MCI preserves the ampulla and, thus, maintains the closed lacrimal system. This could partly explain the widely reported reduced functional success with snip punctoplasty procedures in spite of anatomically patent puncta. Complications rates observed in current study were no different from previous studies. Restenosis rates were similar to previously reported rates ranging from 4.6% to 6%.

Although the outcomes were comparable and statistically not significantly different in the current study, it is important to note that the rates of restenosis were less frequent, and functional outcomes appeared better in the minimally invasive group as compared with the 3-snip punctoplasty. Strengths of the current study are head to head comparison of large number of puncta, use of pre- and postoperative Munk scale and punctal grading, and the uniform minimum follow up of 6 months. Limitations of current series are its retrospective nature, assessment of severe ends of disease spectrum in both the groups, lower sample sizes in subgroups, and lack of cost comparisons and long-term outcomes.

In conclusion, minimally invasive approach in the form of punctal dilatation with mini-monoka intubation can be employed as an effective alternative to the more invasive snip punctoplasty in the management of acquired punctal stenosis.

REFERENCES