นิพนธ์ต้นฉบับ Original Article

การวิเคราะห์เปรียบเทียบประสิทธิผลการผ่าตัดแบบย้อนหลัง: วิธี Jones เทียบกับเทคนิคผสมผสาน Jones–Hotz ในการจัดการภาวะหนังตาล่างม้วนเข้าจากความเสื่อมที่โรงพยาบาลสกลนคร

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บทคัดย่อ

ภาวะหนังตาล่างม้วนเข้าจากความเสื่อมเป็นโรคตาที่พบได้บ่อยในประชากรเอเชีย โดยเฉพาะอย่างยิ่งท่ามกลางการเปลี่ยนผ่านทางประชากรศาสตร์สู่สังคมผู้สูงอายุ ภาวะดังกล่าวส่งผลกระทบอย่างมีนัยสำคัญต่อคุณภาพชีวิตของผู้ป่วยผ่านความไม่สบายของดวงตาและการรบกวนการมองเห็น การลดความหนาและความหย่อนคล้อยของเนื้อเยื่อ capsulopalpebral fascia (CPF) ที่เกิดจากอายุเป็นข้อจำกัดพื้นฐานต่อประสิทธิผลของการเย็บดึงกล้ามเนื้อดึงหนังตาแบบ Jones เพียงอย่างเดียว ทำให้จำเป็นต้องมีการแทรกแซงทางศัลยกรรมเสริม การศึกษานี้มีวัตถุประสงค์เพื่อประเมินประสิทธิผลเปรียบเทียบระหว่างวิธี Jones เพียงอย่างเดียวกับแนวทางแบบผสมผสาน Jones–Hotz ในการแก้ไขภาวะหนังตาม้วนเข้า

วิธีการศึกษา: ดำเนินการศึกษาเชิงวิเคราะห์แบบ cohort ย้อนหลังในผู้ป่วยที่ได้รับการผ่าตัดแก้ไขภาวะหนังตาล่างม้วนเข้าระหว่างเดือนมกราคม พ.ศ. 2558 ถึงเดือนธันวาคม พ.ศ. 2566 ศัลยแพทย์คนเดียวทำการผ่าตัดทั้งหมด การศึกษาประกอบด้วยหนังตา 88 ข้างที่แบ่งออกเป็นสองกลุ่ม: กลุ่ม A (n = 47) ได้รับการเย็บดึงกล้ามเนื้อดึงหนังตาแบบ Jones เพียงอย่างเดียว ในขณะที่กลุ่ม B (n = 41) ได้รับการเย็บดึงกล้ามเนื้อดึงหนังตาแบบ Jones ร่วมกับวิธี Hotz แบบดัดแปลง เกณฑ์การคัดเข้าคือภาวะหนังตาม้วนเข้าจากความเสื่อมที่ไม่มีความหย่อนคล้อยของหนังตาในแนวนอนและมีการติดตามผลอย่างน้อย 6 เดือน ตัวชี้วัดผลลัพธ์หลักคืออัตราการกลับเป็นซ้ำ ตัวชี้วัดผลลัพธ์รองคือระยะเวลาในการผ่าตัด

ผลการศึกษา: ลักษณะทางประชากรศาสตร์แสดงให้เห็นว่าไม่มีความแตกต่างระหว่างกลุ่มอย่างมีนัยสำคัญทางสถิติ (อายุเฉลี่ย 70.6 ปี ช่วงอายุ 61–92 ปี เพศชายมีสัดส่วนมากกว่า คิดเป็น 72%) การแก้ไขทิศทางของขนตาให้กลับสู่ตำแหน่งปกติสำเร็จในผู้ป่วยทุกรายพร้อมความพึงพอใจของผู้ป่วยร้อยเปอร์เซ็นต์ กลุ่ม A มีอัตราการกลับเป็นซ้ำ 19.15% (9 จาก 47 ราย) โดยมีระยะเวลาผ่าตัดเฉลี่ย 30.6 นาที กลุ่ม B แสดงผลลัพธ์ที่ดีกว่าอย่างมีนัยสำคัญด้วยอัตราการกลับเป็นซ้ำ 4.65% (2 จาก 41 ราย $p<0.05$, Fisher's exact test) และระยะเวลาผ่าตัดเฉลี่ย 41.4 นาที ค่าอัตราส่วน (odds ratio) 0.21 บ่งชี้ว่าผู้ป่วยในกลุ่ม B มีโอกาสกลับเป็นซ้ำต่ำกว่าประมาณ 4.76 เท่าเมื่อเทียบกับกลุ่ม A พบภาวะหนังตาพลิกออกเล็กน้อยที่หายได้เองจำนวน 1 รายในกลุ่ม B

สรุปและข้อเสนอแนะ: วิธีผสมผสาน Jones–Hotz แสดงให้เห็นความเหนือกว่าอย่างมีนัยสำคัญทางสถิติเมื่อเทียบกับการเย็บดึงกล้ามเนื้อดึงหนังตาแบบ Jones เพียงอย่างเดียวในการรักษาภาวะหนังตาม้วนเข้าจากความเสื่อมที่ไม่มีความหย่อนคล้อยในแนวนอน โดยลดอัตราการกลับเป็นซ้ำจาก 19% เหลือ 5% ระยะเวลาผ่าตัดที่เพิ่มขึ้น 10.8 นาทีถือเป็นการแลกเปลี่ยนที่ยอมรับได้ทางคลินิกสำหรับผลลัพธ์ระยะยาวที่ดีขึ้นอย่างมีนัยสำคัญ แนวทางผสมผสานนี้จัดการกับปัจจัยทางพยาธิสรีรวิทยาหลายประการ โดยเฉพาะการแยกตัวของเนื้อเยื่อ CPF และการทับซ้อนของกล้ามเนื้อ orbicularis ส่วน preseptal ทำให้ได้รับการแก้ไขทางกายวิภาคที่ครอบคลุม ผลการค้นพบเหล่านี้สนับสนุนการนำเทคนิคผสมผสานมาใช้เป็นวิธีการผ่าตัดที่เหมาะสมสำหรับภาวะหนังตาม้วนเข้าจากความเสื่อมในผู้ป่วยที่มีข้อบ่งชี้

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คำสำคัญ: การเย็บดึงกล้ามเนื้อดึงหนังตาแบบ Jones วิธี Hotz ภาวะหนังตาม้วนเข้าจากความเสื่อม อัตราการกลับเป็นซ้ำ ผลลัพธ์การผ่าตัดเปรียบเทียบ ประสิทธิผลการผ่าตัด

Retrospective Comparative Analysis of Surgical Efficacy: Jones Procedure versus Combined Jones–Hotz Technique in the Management of Involutional Entropion at Sakon Nakhon Hospital

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Abstract

Background: Involutional entropion represents a prevalent ophthalmic disorder in Asian populations, particularly amid the demographic transition toward aging societies. The condition significantly impairs patients' quality of life through ocular discomfort and visual disturbances. Age–related attenuation and laxity of the capsulopalpebral fascia (CPF) fundamentally limits the efficacy of isolated Jones retractor plication, necessitating supplementary surgical interventions. This study evaluates the comparative effectiveness of the Jones procedure alone versus a combined Jones–Hotz approach in entropion correction.

Methods: A retrospective comparative cohort study was conducted examining patients who underwent lower eyelid entropion repair between January 2015 and December 2023. All procedures were performed by a single surgeon. The study comprised 88 eyelids divided into two groups: Group A (n=47) underwent Jones retractor plication exclusively, while Group B (n=41) received combined Jones retractor plication with modified Hotz procedure. Inclusion criteria specified involutional entropion without horizontal eyelid laxity and minimum six–month follow–up. Primary outcome measure was recurrence rate; secondary outcome was operative duration.

Results: Demographic characteristics demonstrated no statistically significant intergroup differences (mean age 70.6 years, range 61–92; male predominance 72%). Complete correction of ciliary orientation was achieved in all patients with universal patient satisfaction. Group A demonstrated a recurrence rate of 19.15% (9/47 cases) with mean operative time of 30.6 minutes. Group B exhibited significantly superior outcomes with a recurrence rate of 4.65% (2/41 cases; $p<0.05$, Fisher's exact test) and mean operative time of 41.4 minutes. The odds ratio of 0.21 indicated Group B patients had approximately 4.76–fold lower recurrence odds compared to Group A. One case of mild, self–resolving ectropion occurred in Group B.

Conclusions: The combined Jones–Hotz procedure demonstrates statistically significant superiority over isolated Jones retractor plication in treating involutional entropion without horizontal laxity, reducing recurrence rates from 19% to 5%. The incremental operative time of 10.8 minutes represents a clinically acceptable trade–off for substantially improved long–term outcomes. This combined approach addresses multiple pathophysiological factors—specifically CPF dehiscence and preseptal orbicularis

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override—thereby providing comprehensive anatomical correction. These findings support adoption of the combined technique as the preferred surgical intervention for involutional entropion in appropriate candidates.

Keywords: Jones retractor plication, Hotz procedure, Involutional entropion, Recurrence rate, Comparative surgical outcomes, Operative efficacy

Entropion

Entropion is a common eyelid malposition in which the margin turns inward against the globe. Entropion, turning in of the eye–lid, can lead to discomfort, conjunctival injection, ocular irrigation, tearing, discharge, corneal erosions, visual difficulties, and aesthetic disfigurement, and corneal ulcers in severe cases (Fig. 1). The prevalence rate among the elderly population is 2.1%, which increases with age.[1] while a higher incidence is seen among East Asians compared to non–East–Asians.[2,3] Surgical treatment of entropion has been shown to positively impact quality–of–life[4.] Because the most appropriate surgical option may differ depending on the lid margin, it is important to differentiate true entropion from other conditions causing ciliocorneal touching, such as epiblepharon, distichiasis, or diseases that destroy the lid margin architecture.

Involutional entropion generally occurs with advancing age. The main factors involved in involutional entropion include horizontal and vertical lower eyelid laxity and overriding of the preseptalorbicularis oculi muscle (OOM) onto the pretarsal OOM[5,6].

Horizontal laxity is treated using lower eyelid shortening procedures, such as wedge resection of the tarsus, a lateral tarsal strip (LTS) procedure, or lateral canthopexy. Overriding of the preseptal OOM is corrected by transverse blepharotomy (Wies procedure), OOM tightening, excision, transposition

the Hotz–Celsus procedure, or nonsurgical procedures such as the injection of Botulinum toxin.[7,8,9]

The treatment of involutional entropion requires correcting underlying causative factors, for which many surgical procedures have been described Vertical lower lid laxity is treated by altering the lower eyelid retractors (capsulopalpebral fascia, CPF), for example by plication, shortening, or reinsertion (Jones procedure).

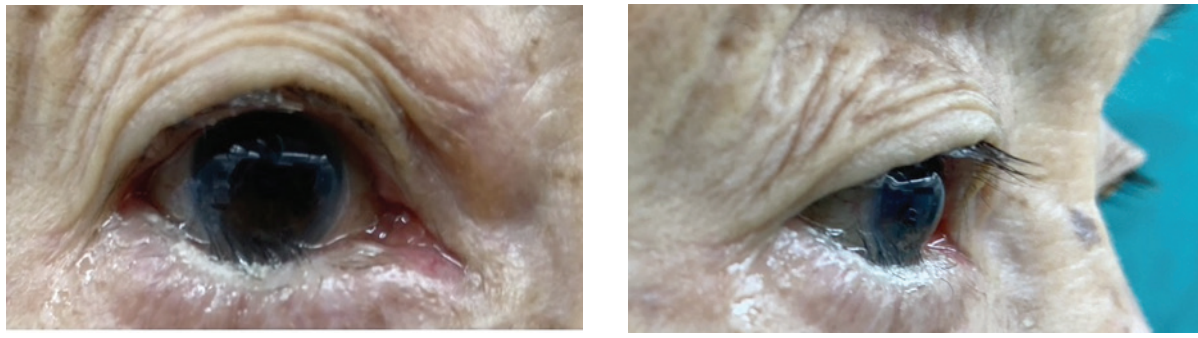
The study documenting thickening of the tarsus in involutional lower eyelid entropion. Moreover, dehiscence of the lower eyelid retractor was proven histopathologically in 95% of the entropic lids. With this in mind, correction of vertical instability should be mandatory in involutional lower eyelid entropion repair.

Many causative factors and treatment procedures have been advocated to explain and correct involutional lower eyelid entropion. These are chosen according to the patient's condition, such as the presence of vertical laxity, horizontal laxity, and OOM overriding. A combination of these procedures to correct multiple factors further decreases the recurrence rate. Due to the lack of comparative studies, the best surgical technique remains controversial.

the findings of a study on involutional lower eyelid entropion, emphasizing the importance of correcting vertical instability in entropion repair. It also mentions various factors and treatment options for this condition, noting that combining procedures can reduce recurrence rates. The passage concludes by stating that the optimal

surgical technique remains debatable due to a lack of comparative studies.

Fig 1. Entropion is a condition in which the eyelid margin turns inward against the globe. Materials and methods–

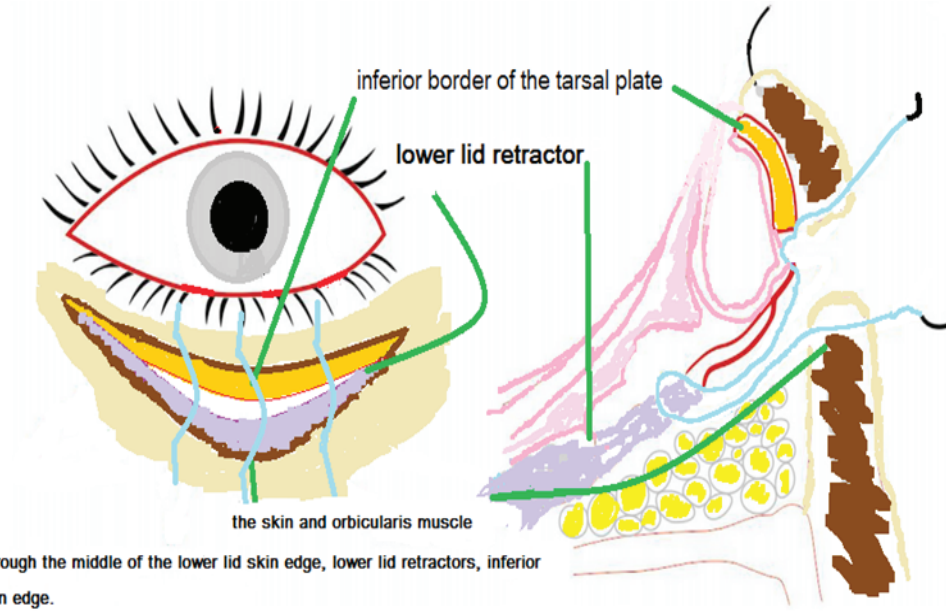


A retrospective comparative study approved by the Ethics Committee of Sakon Nakhon Hospital"

The medical records of patients who had undergone surgery to correct involutional entropion were retrospectively and comparatively reviewed. Age, sex, follow–up time, and type of surgery were examined from the patients' medical records. The inclusion criteria were as follows: patients diagnosed with involutional entropion without horizontal eyelid laxity and with a mean follow–up interval of at least 6 months after surgery.

A standard lower eyelid retractor plication was performed as described by Jones et al. (1972). After giving local anesthesia, a horizontal skin incision is made 4–5 mm below the eyelash line extending from the lateral side to the medial side until the junction of the medial 1/3 and lateral 2/3, and the orbicularis muscle under the skin is exposed.. Hemostasis was performed by electrocautery and identification of the lid retractors is done after raising a skin muscle flap and inferiorly retracting the pre–aponeurotic fat. After clearly visualizing the anatomy, for the first central suture placement, a 6–0 absorbable suture is passed through firstly the skin, the lower orbicularis muscle, the inferior lid retractor, inferior tarsal plate the superior orbicularis muscle and back through the skin of the upper half of the incision. Adjustment of the suture was done in order to avoid any over or under correction. (Fig. 2) The same technique was done for placing sutures medially and laterally. After achieving hemostasis, skin sutures were taken with the same 6–0 non–absorbable sutures which were removed after 14 days.

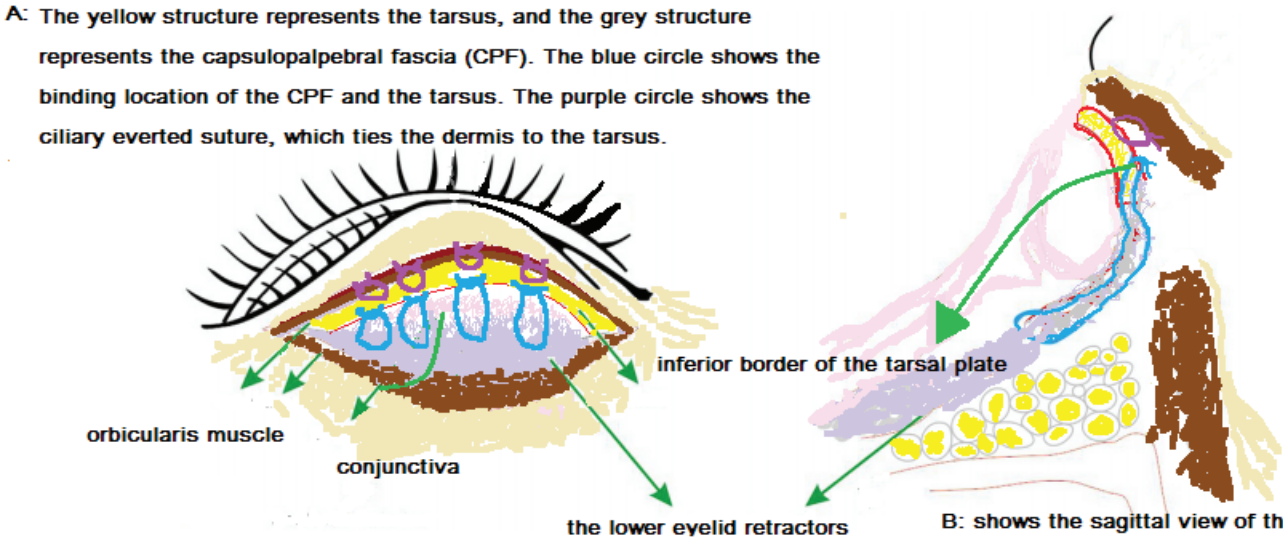
Fig. 2.



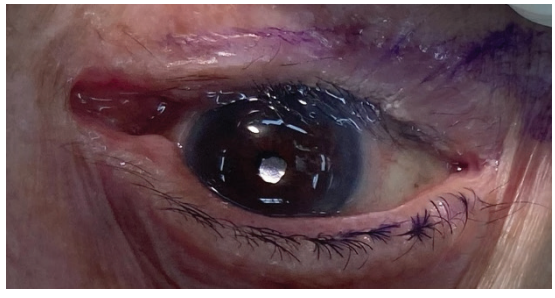
A The suture was passed through the middle of the lower lid skin edge, lower lid retractors, inferior tarsal plate, and upper skin edge.
The diagram shows a schematic illustration of the Jones retractor plication technique. It includes plication sutures, represented by vertical lines passing through the lower lid retractors. B shows the sagittal view of the technique

Combination of a modified Hotz procedure with the Jones procedure Local anesthetic infiltration of the eyelid with lidocaine HCl with epinephrine was performed. A horizontal skin incision was made 4–5 mm below the eyelash line extending from the lateral side to the medial side until the junction of the medial 1/3 and lateral 2/3. The incision was made with a No. 15 scalpel blade. 6–0 nylon sutures retracted the eyelid skin for separation of the skin and orbicularis muscle. The orbicularis muscle was carefully dissected with scissors until the lower edge of the tarsal plate was reached. It was dissected downward until the lower lid retractors were visualized. The layer between the orbicularis and septum–capsulopalpebral fascia (CPF) complex was separated, being careful during dissection to avoid entering the conjunctival space. After exposure of the anterior layer, an advancement of approximately 3–5 mm (tarsus–CPF tightening) was performed with three mattress sutures of 6–0 non–absorbable suture material. After the Jones procedure with CPF was completed, the modified Hotz procedure (ciliary–everted suture) was performed between the tarsus and dermis layer strong enough to support sutures. Normally, four or five stitches were used, depending on the patient's condition and location of the offending lashes. After achieving good hemostasis, the initial 6–0 nylon traction sutures were removed. The skin was closed with 6–0 nylon sutures. (Fig. 3) Postoperatively, eyelash position, direction in relation to the globe, and visual field were evaluated to ensure no complications from the surgery. The wound was dressed with sterile technique. Skin sutures were removed in the first week.

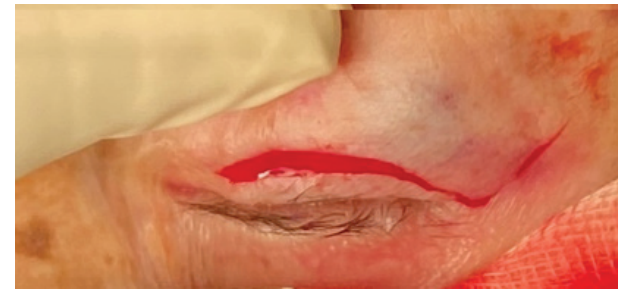
Fig. 3.



A

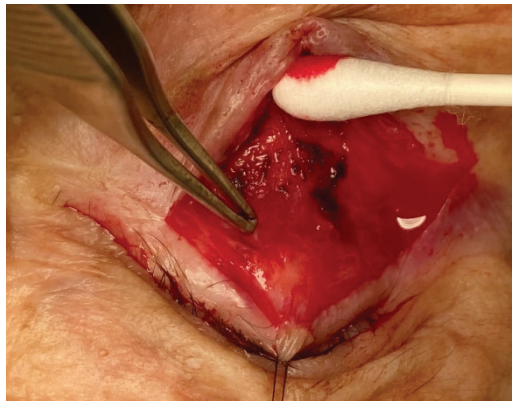


B

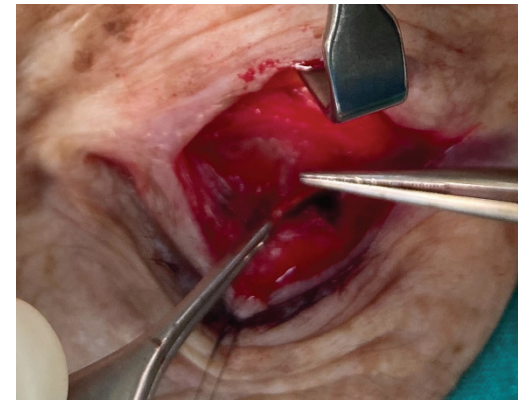


The skin was marked parallel to the lid edge from the punctum to the lateral canthus

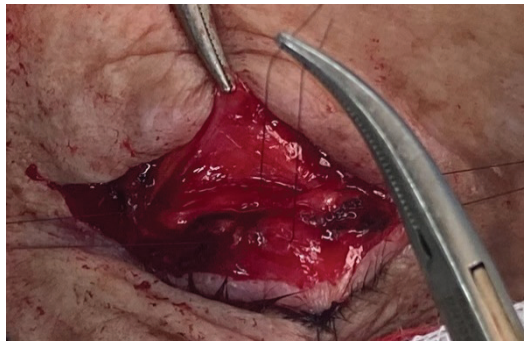
C Identification of the lower lid retractors

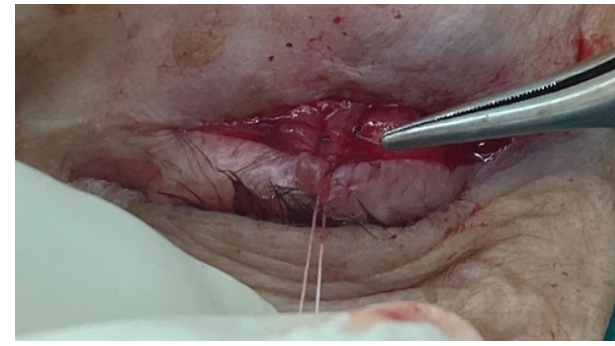


D The lower lid retractors

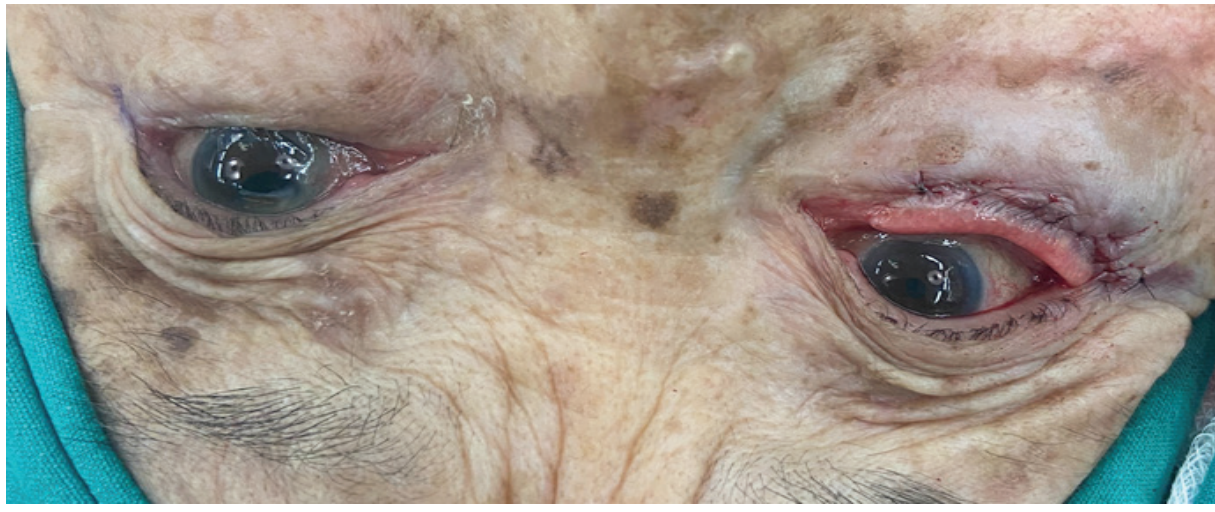


E After the exposure of the anterior layer, an advancement of approximately 5 mm (tarsus–CPF tightening) is performed with three mattress sutures of 6–0 nylon





F the ciliary everted suture, which ties the dermis to the tarsus we added the modified Hotz procedure to the entropion repair.



Result

Fig. 4

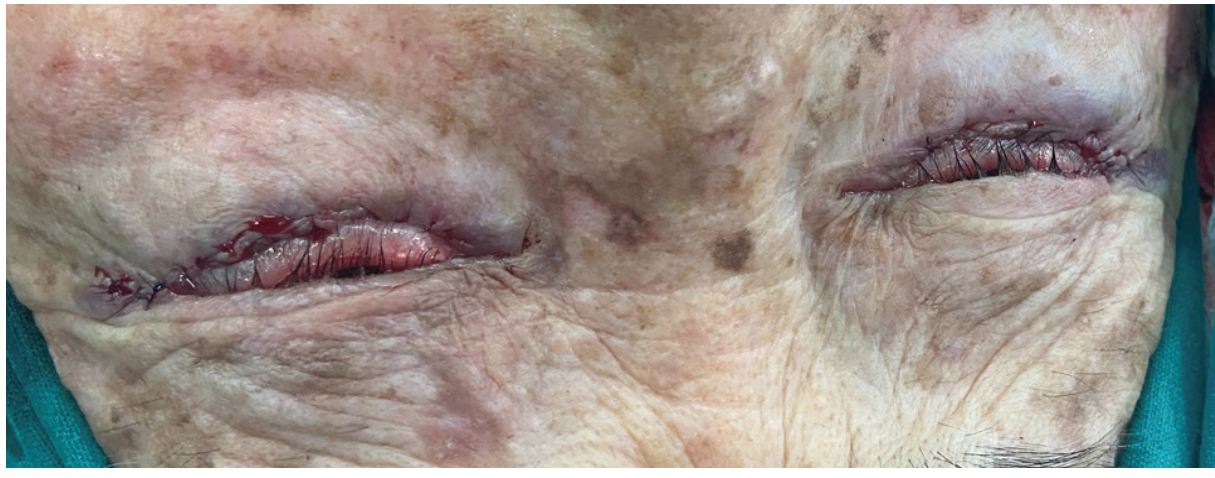


Fig. 5

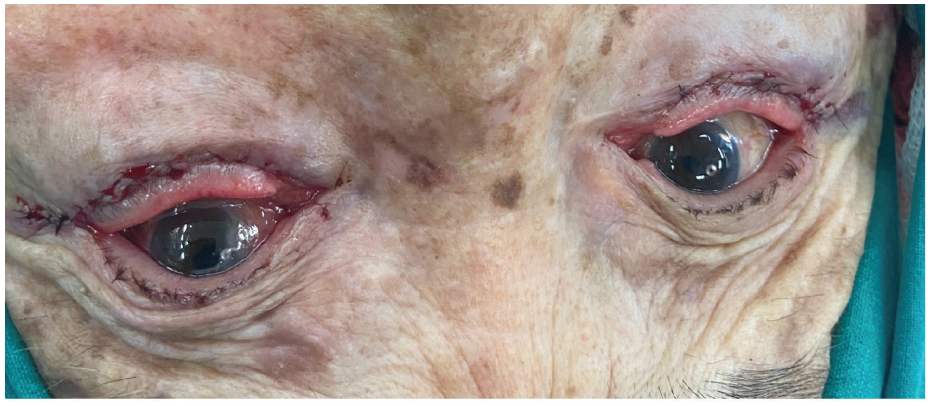
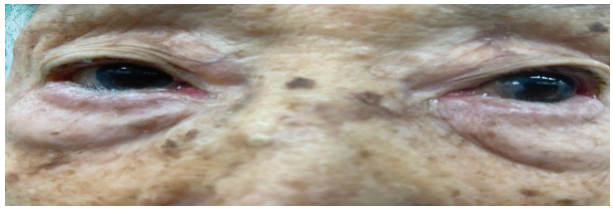
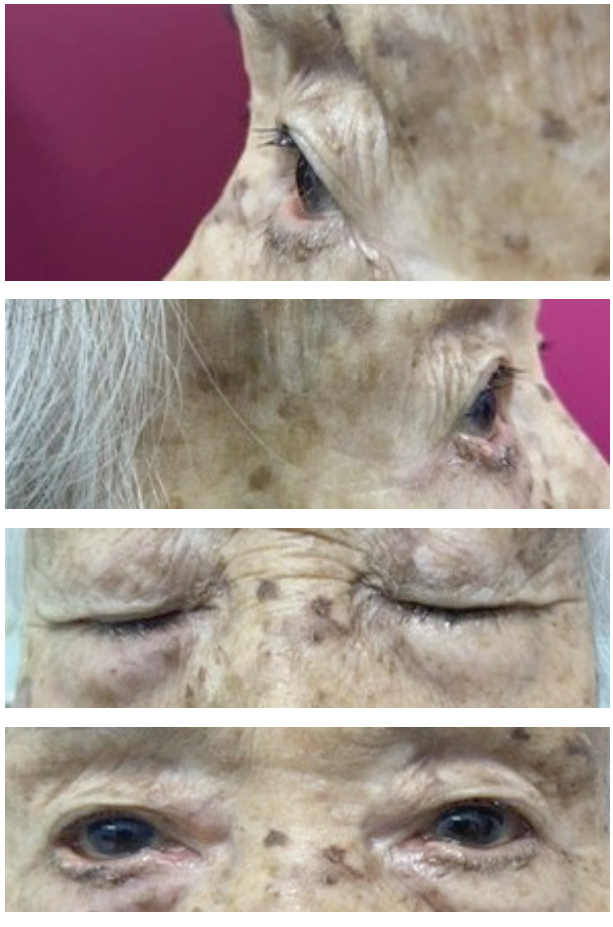


Fig. 6

Before



AFTER 1 month



Result

The average age of the two groups is 70.6 years old. The age range is between 61 and 92 years old. 72% of the group is male. 28% of the group is female. From this information, it can be concluded that this is an elderly group with a higher proportion of males than females. The average age is around 70 years old, with the oldest person being 92 years old and the youngest being 61 years old. All patients were able to achieve an acceptable orientation of the ciliary body (part of the eye), and all patients were satisfied with the surgery after the procedure and follow–up examinations. Some cases had overcorrection, but it resolved on its own within a short period of time. (Fig. 4–6)

Table 1 Patient demographics and outcomes.

	Group A (n: 47)	Group B (n:41)	P value
Age (years, mean ± SD)	72.6 ± 8.5	73.4 ± 9.7	0.926*
Sex (n, female/male)	21/26	18/23	0.796
Recurrence (n, %)	9 (19.15%)	2 (4.65%)	0.015

n: number, SD: standard deviation.

*P value: independent sample t–test.

P value: chi–squared test. P value: Fisher exact test.

There were no statistically signficant differences between the two groups in terms of mean age, sex (p:0.926, p:0.796) The cases in which the Jones procedure alone was used (average age 72.0 years, 47 eyes total) reported 9 recurrences, patients without recurrence 38 which corresponds to a recurrence rate of over 19 % at a follow–up duration of at least 6 months. Average surgery time = 30.6 minutes. The combined method was used (average age 73.0 years, 41 eyes total) reported 2 recurrences, patients without recurrence 41 which corresponds to a recurrence rate of over 4.5 % at a follow–up duration of at least 6 months. Average surgery time = 41.4 minutes. Number of patients with mild ectropion = 1 (included in patients without recurrence) The p–value of 0.0153 shows a statistically significant difference at the 0.05 level in the recurrence rates between Group B and Group A.The Odds Ratio of 0.21 means the odds of recurrence in Group B are about 1/0.21 = 4.76 times lower compared to Group A. Including the patient with mild ectropion in Group B among those without recurrence does not affect the p–value and Odds Ratio calculations since only recurrence is considered. The average surgery time is also not used in these statistical calculations.

Discussion

An ideally effective surgical technique should comprehensively address all causative factors while minimizing recurrence rates. Numerous surgical approaches have been described to correct the anatomical derangements associated with involutional entropion, yielding variable success rates.[10,11,12,13,14]

Horizontal eyelid laxity can be ameliorated through lid–shortening procedures, whereas vertical laxity is optimally managed via retractor plication, shortening, reinsertion, or fornix suture placement that engages the retractor complex. Transverse blepharotomy and everting sutures have been employed to prevent preseptal orbicularis override. The sutures induce scarring

and adhesion formation between the inferior retractors and tarsal plate during their dissolution, thereby preventing further inward rotation and subsequent recurrence.

Surgical interventions for involutional entropion are generally classified into three categories: (1) techniques vertically shortening the anterior eyelid lamella; (2) techniques vertically lengthening the posterior eyelid lamella; and (3) techniques directly reversing lower eyelid malposition. The literature documents various approaches for correcting involutional lower eyelid entropion[15,16,17,18,19,20], with divergent success and recurrence rates reported following different modified or combined surgical procedures.

In the absence of horizontal eyelid laxity, as observed in our patient cohort, the Wies and Jones procedures constitute viable alternative options. Although the Jones technique may serve as a primary intervention, it is predominantly employed for recurrent involutional entropion. Athavale and O'Donnell [21] demonstrated that lateral tarsal strip (LTS) combined with a modified Jones technique—involving lower eyelid retractor reattachment to the anterior tarsal surface—constituted an efficacious surgical approach based on 24–month follow–up data.

This retrospective comparative study examined two surgical modalities for correcting involutional entropion in patients without horizontal eyelid laxity: Jones retractor plication alone (Group A) versus a combined Jones–Hotz technique (Group B). Patient demographics revealed no statistically significant intergroup differences regarding age and sex distribution, with mean ages ranging from 70–73 years and male predominance.

The primary outcome measure was entropion recurrence rate following a minimum 6–month follow–up period. The results demonstrated that Group A (Jones procedure alone) exhibited a recurrence rate of 19.15% (9/47 cases), whereas Group B (combined Jones–Hotz procedure) demonstrated a significantly lower recurrence rate of 4.65% (2/41 cases). This intergroup difference achieved statistical significance ($p=0.015$). One patient in Group B experienced mild, self–limiting ectropion, which did not influence the statistical analysis. Mean operative duration was prolonged for the combined procedure in Group B (41.4 minutes) compared to Group A (30.6 minutes).

The study concludes that augmenting Jones retractor plication with the modified Hotz procedure significantly reduces involutional entropion recurrence compared to the Jones procedure alone, despite requiring extended operative time. These findings suggest that this combined approach represents an effective surgical treatment for involutional entropion in the geriatric population.

Technical Considerations and Mechanistic Rationale

The surgical techniques employed in the Jones and modified Hotz procedures exhibit several key distinctions. The Hotz procedure necessitates more extensive tissue dissection and layer separation. Additionally, it incorporates ciliary–everted sutures between the tarsus and dermis—elements absent in the isolated Jones technique. The Hotz procedure specifically involves tarsus–CPF complex advancement and tightening, with the combined approach utilizing a greater total suture count. The combined Jones–Hotz procedure addresses multiple anatomical factors contributing to entropion through a more complex surgical algorithm. These technical differences likely

account for the reduced recurrence rate observed with the combined approach, albeit at the expense of prolonged operative duration.

Synergistic Mechanisms Underlying Superior Outcomes

The integration of the Jones procedure with the modified Hotz technique yields improved outcomes and reduced recurrence rates through several mechanisms:

Comprehensive anatomical correction: The Jones procedure primarily addresses lower eyelid retractor laxity, whereas the Hotz procedure targets preseptal orbicularis override. Their combination enables simultaneous correction of multiple anatomical factors contributing to entropion pathogenesis.

Biomechanical stress redistribution: The combined approach may distribute corrective forces more uniformly across eyelid structures, potentially reducing mechanical stress at individual repair sites and enhancing correction durability.

Management of age–related changes: Given the patient cohort's mean age (70–73 years), multifactorial contributions to entropion are anticipated. The combined approach comprehensively addresses diverse age–related structural changes in eyelid anatomy.

Enhanced lid margin stability: The supplementary Hotz procedure provides additional lower eyelid margin support, reducing recurrence probability by establishing more stable lid positioning.

Individualized surgical customization: The combined technique permits precise correction tailored to each patient's specific anatomical pathology, which may vary in severity and presentation.

Evidence Supporting Combined Approach Superiority

Long–term efficacy: The substantially lower recurrence rate in Group B (4.65% vs. 19.15%) indicates that the combined approach provides more durable correction, likely attributable to its comprehensive management of underlying pathophysiological factors.

Risk–benefit optimization: Despite prolonged mean operative duration (41.4 vs. 30.6 minutes), the markedly reduced recurrence rate demonstrates that the additional time investment yields favorable long–term outcomes.

Economic implications: Although not directly examined in this study, the lower recurrence rate potentially translates to fewer revision surgeries, suggesting enhanced cost–effectiveness for the combined approach over extended follow–up.

Minimal complication increment: The documentation of only one mild ectropion case in Group B suggests that the additional procedure does not substantially elevate complication risk.

Statistical robustness: The p–value of 0.015 confirms statistically significant intergroup differences in recurrence rates, providing compelling evidence for combined approach superiority.

Clinical significance: The odds ratio indicating 4.76–fold lower recurrence odds in Group B underscores the combined technique's clinical effectiveness.

Potential Challenges and Technical Considerations

Surgeons should recognize four key challenges when performing the combined Jones–Hotz technique:

Increased surgical complexity and duration: The combined approach requires proficiency in both techniques and extended operative time,

potentially elevating anesthesia–related risks, particularly in elderly patients.

Overcorrection risk: Pursuing comprehensive correction may inadvertently overcorrect the entropion, potentially inducing ectropion (outward eyelid turning).

Tissue trauma and healing considerations: More extensive dissection and tissue manipulation may precipitate increased postoperative edema, ecchymosis, or prolonged healing intervals.

Biomechanical force equilibration: Surgeons must meticulously balance corrective forces from both procedures to achieve optimal outcomes without creating iatrogenic complications or compromising natural eyelid contour and function.

These considerations underscore the importance of adequate training, judicious patient selection, and meticulous surgical planning when implementing this combined technique. Despite prolonged operative duration, the reduced recurrence rate may yield fewer revision procedures, potentially establishing superior long–term cost–effectiveness.

Study Limitations

This investigation possesses several inherent limitations. As a retrospective study, it is subject to potential selection bias and lacks randomization. Both cohorts comprised relatively small sample sizes, potentially limiting result generalizability. Potential confounding variables (e.g., surgeon experience, entropion severity) were not systematically controlled. Furthermore, the minimum 6–month follow–up duration may prove insufficient for detecting late recurrences.

Future Research Directions

Future investigations should include large–scale, prospective randomized controlled trials to validate these findings, comprehensive evaluation of long–term outcomes and patient–reported satisfaction metrics, and systematic exploration of technical refinements to further optimize surgical outcomes. While this study provides valuable evidence supporting the combined surgical approach, more comprehensive investigation addressing these considerations would further strengthen clinical recommendations and evidence–based practice.

Conclusion

Multiple causative factors and therapeutic interventions have been proposed to explain and correct involutional lower eyelid entropion. Surgical technique selection depends on individual patient characteristics, including the presence of vertical laxity, horizontal laxity, and orbicularis oculi muscle override. Combination procedures addressing multiple pathophysiological factors further reduce recurrence rates. Due to limited comparative investigations, the optimal surgical technique remains subject to debate.

In conclusion, while the Jones procedure alone demonstrates efficacy, this study provides compelling evidence that its combination with a modified Hotz procedure yields significantly superior outcomes regarding recurrence rates. The incremental operative time represents a clinically acceptable trade–off for improved long–term results and reduced revision surgery requirements.

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