Research Square

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Laser Circumcision versus Conventional Circumcision: A Retrospective Comparative Study

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Research Article

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Abstract

Purpose

To evaluate outcomes of carbon dioxide (CO_2) laser circumcision compared with conventional surgical techniques in adult males, focusing on pain, bleeding, edema, and cosmetic appearance.

Methods

We retrospectively analyzed records of 50 patients (25 laser, 25 conventional) circumcised under general anesthesia between January 2023 and April 2025. Pain was assessed using a visual analog scale (VAS) at 30, 60, 90, 120 minutes, and 24 hours postoperatively. Bleeding, edema, and cosmetic outcomes were also recorded.

Results

Laser circumcision was associated with significantly lower pain scores ($p < 0.001$), minimal bleeding, and reduced edema compared with conventional surgery. Cosmetic outcomes were superior in the laser group, with 76% rated “very good” versus 8% in the conventional group.

Conclusion

CO_2 laser circumcision offers a safer and more effective alternative to conventional methods, with reduced postoperative pain, bleeding, edema, and improved cosmetic results. *Trial registration: retrospectively registered.*

Introduction

Circumcision is a common surgical procedure performed for medical, cultural, and religious reasons [1, 2]. Conventional techniques are widely used but may be associated with postoperative pain, bleeding, and edema. With advances in surgical technology, CO_2 laser has emerged as a potential alternative offering improved hemostasis and cosmetic outcomes [4]. This study compares laser and conventional circumcision in adult males.

Materials and Methods

Fifty adult males (> 16 years) underwent circumcision between January 2023 and April 2025. Patients were divided into two groups:

- **Group A (n = 25)**: CO_2 laser circumcision

- **Group B (n = 25)**: Conventional scalpel technique

Pain was assessed using VAS (0–10). Bleeding was classified as minimal, mild, moderate, or severe. Edema was graded as mild, moderate, or severe. Cosmetic outcomes were evaluated at first postoperative review. Statistical analysis was performed using SPSS v28.0, with $p < 0.05$ considered significant.

Results

- **Pain:** Laser group had significantly lower VAS scores ($p < 0.001$).
- **Bleeding:** 84% of laser patients had no bleeding versus 0% in conventional group.
- **Edema:** 84% of laser patients had no edema versus 4% in conventional group.
- **Cosmetic outcomes:** 76% of laser patients rated “very good” versus 8% in conventional group.

Discussion

Laser circumcision demonstrated superior outcomes compared with conventional methods, consistent with prior studies [10–13]. Reduced bleeding and edema are attributed to the hemostatic and sealing properties of CO_2 laser [8]. Cosmetic outcomes were improved due to minimal scarring and precise tissue handling [9].

Conclusion

CO_2 laser circumcision is a safe and effective alternative to conventional techniques, offering reduced pain, bleeding, edema, and superior cosmetic results. Choice of modality should consider surgeon expertise, equipment availability, and patient preference.

Declarations

- **Competing Interests:** The authors declare no competing interests.
- **Consent to Participate/Publish:** Written informed consent was obtained from all participants.
- **Data Availability:** Data supporting the findings are available from the corresponding author upon reasonable request.

Author Contribution

Author A wrote the main manuscript text and prepared the figures. Both authors reviewed the manuscript.

Data Availability:

Data supporting the findings are available from the corresponding author upon reasonable request.

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Tables

Tables 1 to 5 are available in the Supplementary Files section.

Figures

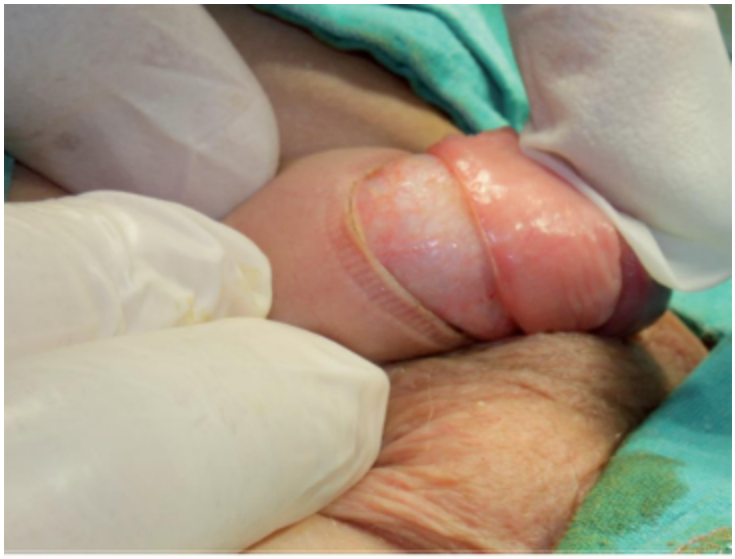


Figure 1

Laser circumcision post operative image



Figure 2

Laser circumcision intraoperative image

Supplementary Files

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- TABLEs1.docx