

# **Comparison of fibrin glue, laser weld, and mechanical suturing device for the laparoscopic closure of ureterotomy in a porcine model.**

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## **Abstract:**

**Purpose:** We evaluated fibrin glue, laser welding, and a mechanical suturing device (Endo-Stitch) as alternatives to standard laparoscopic suturing with a free needle. **Methods:** In 14 pigs, 22 linear proximal ureterotomies were closed laparoscopically with one of 4 different methods: fibrin glue, laser welding, Endo-Stitch suture placement (4-0 polyglactin), and free-needle suture placement (4-0 polyglactin). The ureterotomy was left open in 6 ureters. Acute leakage was tested by instillation of methylene blue. After 12 weeks, the ureters were assessed with radiography, ex-vivo pressure-flow studies, bursting pressures, and histology. **Results:** All alternative closure techniques were more rapid than free-needle suturing, and less frequently allowed acute leakage. Closure with fibrin glue yielded significantly higher flow rates than control, whereas the other closure techniques yielded flow rates similar to that of unclosed ureters. All alternative closure methods demonstrated histological evidence of healing that were superior to free-needle suturing. In multifactorial analysis, leakage at the ureterotomy site was the factor most significantly associated with subsequent poor ex-vivo flow characteristics. **Conclusions:** All of the alternative laparoscopic ureteral closure methods compared favorably with standard free-needle suturing. Fibrin glue produced better radiographic findings, flow characteristics, and histology, suggesting that it currently has the most promise as an alternative or adjunct to laparoscopic suturing. Development of alternative laparoscopic techniques is ongoing, however, and thus the current state-of-the-art techniques used in this study may well be supplanted by other technologies in the future.