

A NOVEL APPROACH: TRAINING URETERAL SUTURING WITH HUMAN HAIR

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INTRODUCTION

This study evaluated the feasibility of using human hair as a cost-effective alternative for training in ureteral surgeries in felines, considering the technical complexity and high cost of conventional suture materials.

METHODOLOGY

Fifty feline ureters obtained from necropsies were distributed among ten participants (n=10) with no prior microsurgery experience. The ureters were incised at the mid-third and subjected to simple continuous sutures using human hair attached to insulin needles. Performance was assessed based on suture quality, occurrence of leakage, execution time, and adaptation to the use of surgical loupes.

RESULTS

Results demonstrated a clear learning curve, with significant improvements in execution time ($p=5.11 \times 10^{-6}$) and operator variability ($p=1.19 \times 10^{-4}$). The average time decreased from 24.10 ± 15.5 minutes on the first attempt to 10.3 ± 2.15 minutes on the final attempt.

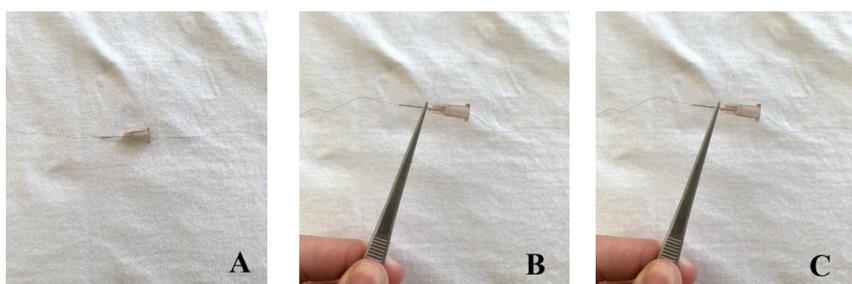


Figure 1: Detailing the process of threading the hair into the needle. (A) The hair is inserted into the needle. (B) Next, the needle is held with forceps at the distal end and gently pressed to the right and left to facilitate the removal of the hub. (C) Finally, with the aid of forceps, the needle is pressed and shaped into a crescent form.

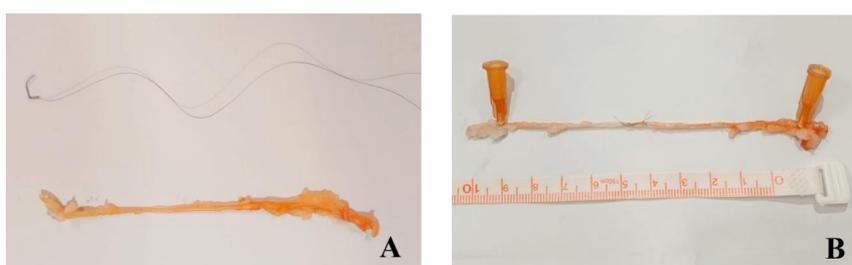


Figure 2: Feline ureter and hair strand used for suturing. (A) Feline ureter collected and fixed on paper, with a hair strand threaded through a needle beside it. (B) Ureter fixed on paper, with a 1 cm incision sutured using a hair strand in a simple continuous suture pattern.

Logistic regression analysis revealed a significant reduction in leakage probability ($p=0.0045$), with leakage rates decreasing from 74% on the first suture to 15.8% on the last. Each subsequent attempt reduced the probability of leakage by a factor of 1.99. By the penultimate suture, only 20% (n=2) of the operators exhibited leakage compared to 90% (n=9) during the first attempt, representing a 70% reduction in leakage rates and a substantial improvement in suture quality throughout the training period. Regarding the use of surgical loupes, 80% of participants initially reported difficulties; however, by the end of the experiment, 100% found the tool beneficial. All participants expressed increased confidence and skill following the training.

CONCLUSION

This study confirms that human hair is a viable and effective alternative for training in ureteral surgeries in felines. Its thickness, comparable to that of conventional sutures, offers a practical and accessible approach, enhancing technical development and training of surgeons for high-complexity procedures.

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