

Comparative Study on the Establishment Efficacy of Four Types of Animal Models of Rectovaginal Fistula in Rabbits

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Introduction

Various surgical methods have so far been developed for treating rectovaginal fistula (RVF), each with its own advantages and disadvantages. The lack of standardized animal models of RVF is a major reason for the failure to establish a unified and effective surgical method for the treatment of RVF.

This study aimed to explore the feasibility of an RVF animal model by magnetic compression and compare it with the traditional modeling method.

Materials and methods

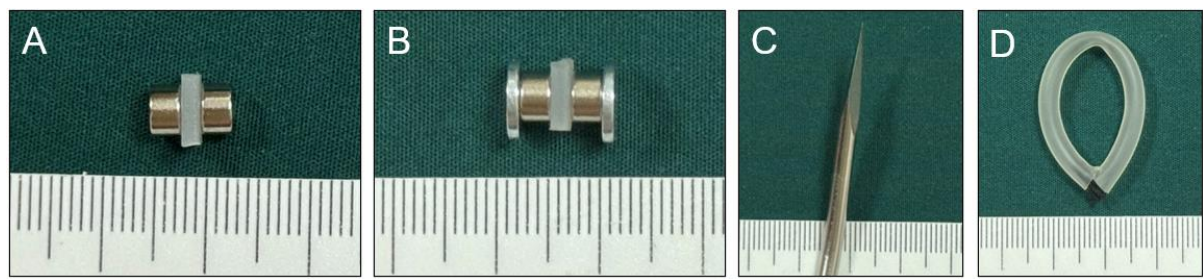


Fig. 1 Devices used for the four groups of rabbits. A. Type A magnet. B. Type B magnet. C. Puncture outfit. D. Plastic hose.

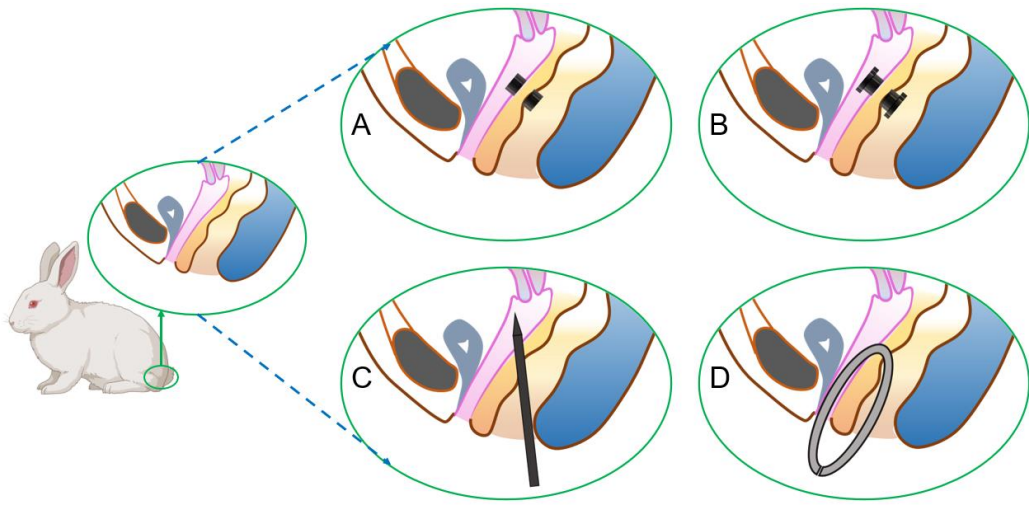


Fig. 2 Schematic of the operation of each group. A. Placement of cylindrical magnets in Group A. B. Placement of T-shaped magnets in Group B. C. Puncturing of the rectovaginal septum in Group C. D. Plastic hose inside the RVF in Group D.

Results

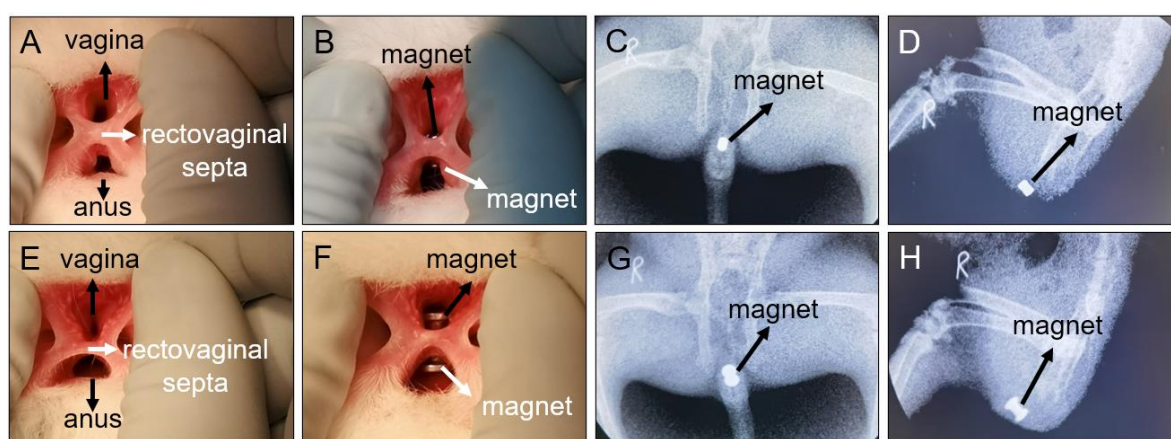


Fig. 3 Representative pictures from groups A and B during the procedure. A-D. The operation of Group A. E-H. The operation of Group B.

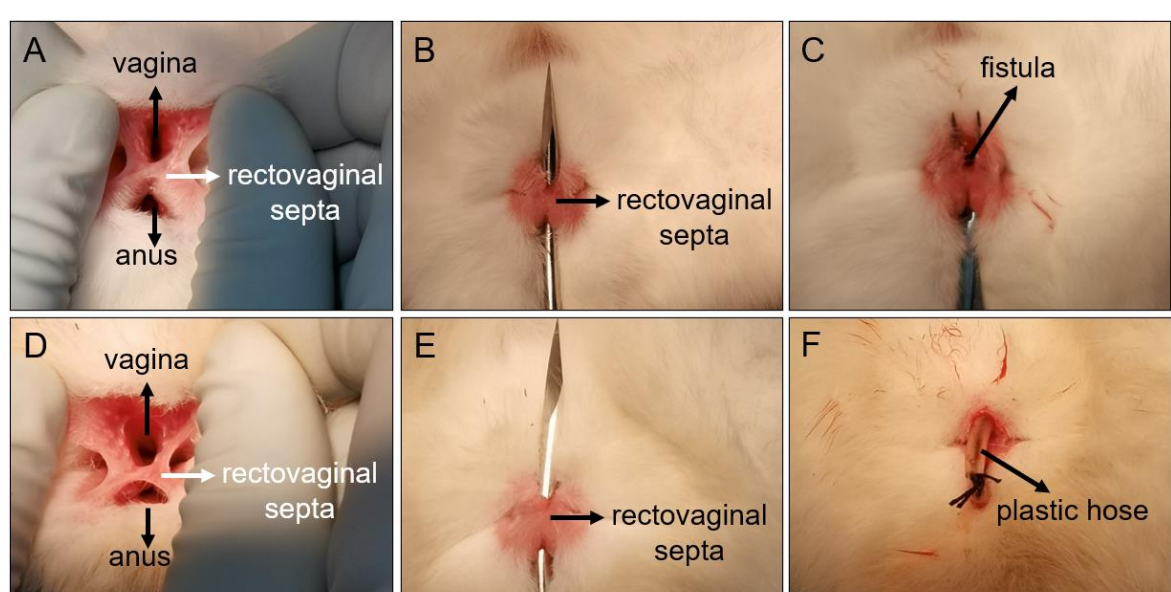


Fig. 4 Representative pictures of groups C and D during the procedure. A. The vagina and rectum were exposed. B. The rectovaginal septum was punctured. C. RVF caused by the puncture. D. The vagina and anus were exposed. E. The rectovaginal septum was punctured. F. Plastic hose present inside the RVF.

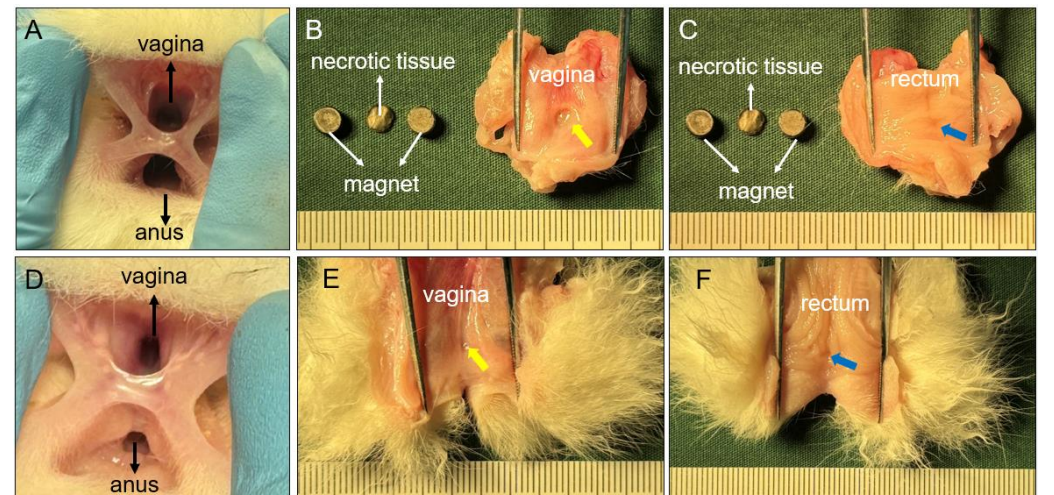


Fig. 5 Gross view of rectovaginal septum specimens of Group A and Group C. A-C. The gross view of Group A. D-F. The gross view of Group C.

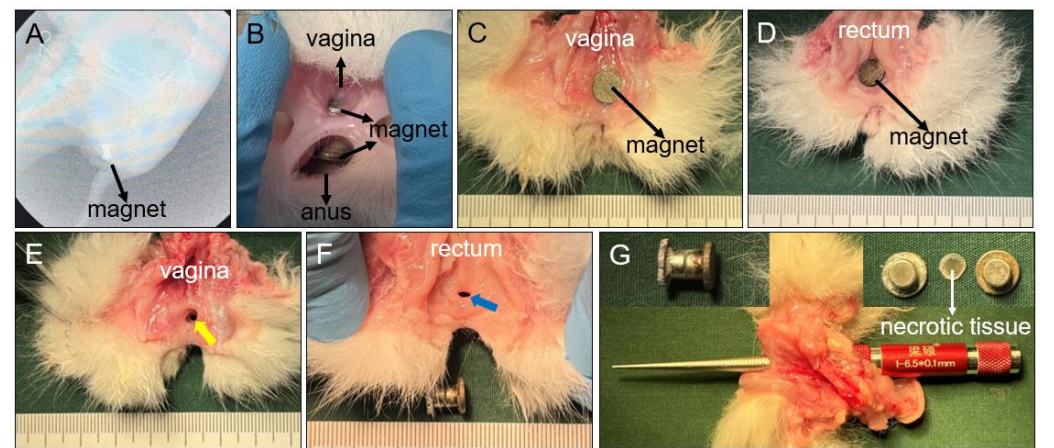


Fig. 6 Gross view of rectovaginal septum specimens of Group B. A. X-ray examination 2 weeks after operation. B. Magnets in the vagina and rectum can be seen in the body. C-D: Longitudinal incision shows the magnet located in RVF. E-F. RVF was observed after removing the magnet. G: T-shaped magnets removed.

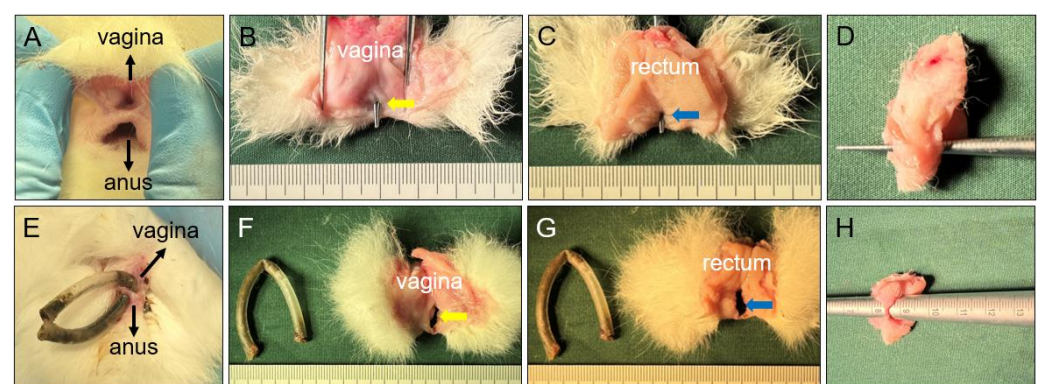


Fig. 7 Group D gross specimens of rectovaginal septum. A. Rectovaginal septum of the experimental rabbit with the plastic tube falling off in advance was observed in the body. B-C. Longitudinal incision shows RVF. D. Diameter of RVF was measured. E-F. Rectovaginal septum of the experimental rabbit during the retention of the plastic tube.

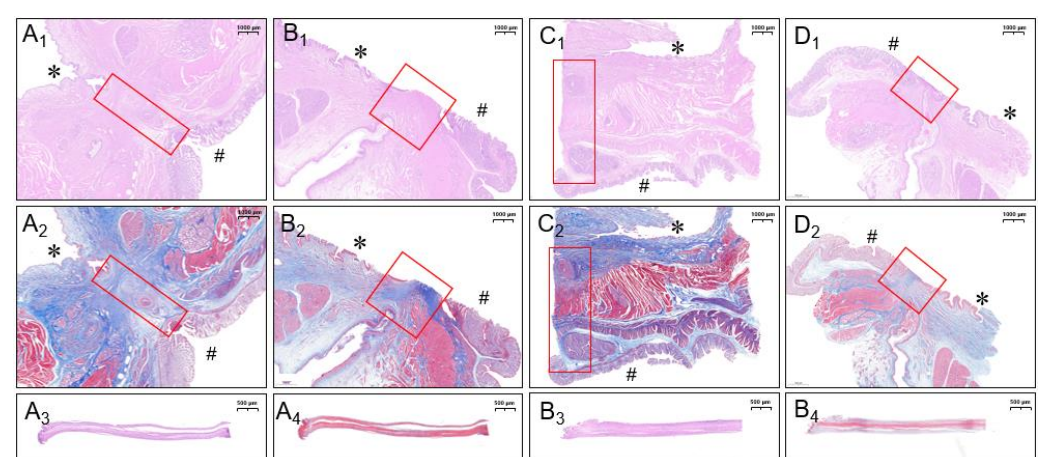


Fig. 8 Histological observation of RVF. A₁₋₂. H&E and Masson staining of Group A RVF. A₃₋₄. H&E and Masson staining of necrotic exfoliated rectovaginal septum in Group A. B₁₋₂. H&E and Masson staining of Group B RVF. B₃₋₄. H&E and Masson staining of necrotic exfoliated rectovaginal septum in Group B. C₁₋₂. H&E and Masson staining of Group C RVF. D₁₋₂. H&E and Masson staining of Group D RVF.

Conclusion

The magnetic compression technique can be used to prepare a rabbit model of RVF. A T-shaped magnet was designed to obtain the optimum model for RVF. We believe that our proposed method can be used as the standard for preparing animal models of RVF.