

Summary

Various surgical techniques for the repair of injured vas deferens in rat experiment

Introduction: The herniotomy for inguinal hernia is one of the most frequent surgical procedures in paediatric surgery. The incidence of complication following primary inguinal herniotomy in neonates is not rare and repair of the injured *vas deferens* (VD) is not standardized.

The aim of this experimental study was to assess the contusion of VD during the surgery with a surgical instrument and to perform and consequently analyze some possibilities of a simple repair method under the control of operating loupe.

Methods: Seventy male rats were divided into seven subgroups according to the type of the vas deferens injury and its repair consequently: 1. Contusion, 2. cut-off and a simple one layer vasovasostomy sewn by absorbable sewing material, 3. cut-off and joining by an intraluminally lead fibre of absorbable sewing material knotted externally, 4. = 3. using non-absorbable sewing material, 5. = 2. combine with intraluminally situated absorbable sewing fibre fixed externally, 6. = 5. combine with intraluminally situated non-absorbable sewing fibre fixed externally, 7. = 5. without external fixation. Fibres of non-absorbable sewing material were removed 3 weeks after the first operation. Operated or injured parts of the VD were examined by a flow rate 90 days after and their morphological changes were evaluated according to local postoperative conditions macroscopically and by histological examination. The part of the vas deferens of the opposite inguinal canal were resected and examined at the same time. They were used as a control group.

Results: The median of the operating time was found lowest in group number one with a simple contusion. The shortest operating times in subgroups with transection were founded in subgroups 3 and 4. The success rate of healing in the qualitative analysis of patency of VD was 100% in subgroup number 1. The best result in subgroups with transection of VD was achieved in group 3 - the index was 90% ($p = 0.0396$). The best patency of VD in the quantitative comparison were achieved in group number 3 ($p = 0.131-0.872$). The results of the other experimental subgroups were unsatisfactory compared to the control group ($p = 0.003 - 0.008$). The smallest morphological differences were found in group 1 - a score index was 0.80, in this case a statistically significant difference was found compared to the subgroups with transection. Moderate changes: 30% (3/10) 77% (22/26), $p = 0.02$; Significant changes: 0% (0/10) vs. 54% (14/26%), $p = 0.003$. The smallest morphological changes were found in subgroups using absorbable sewing material. Contusion of the *vas deferens* had not any substantial pathological influences – healing ratio was 100%. The best method of repair was defined in the joining of the transected VD by an intraluminally lead fibre of absorbable sewing fibre knotted externally – healing ratio 90%, ($p=0.04$). The results of the *vas deferens* postoperative patency and morphological changes in the other experimental groups were unsatisfactory in comparison with controls ($p = 0.003 - 0.008$).

Conclusions: The contusion of the vas deferens did not lead to functional or morphological change, which indicates its good reparative ability. There was found a simple variant of treatment of transected *vas deferens* by the joining of the ends of the VD with intraluminally lead fibre of absorbable sewing fibre knotted externally using operating loupe and fine surgical instruments.

