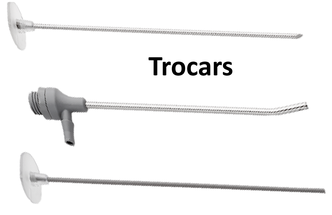
Department of Pediatric Surgery
Dr. von Hauner Children's Hospital
Ludwig-Maximilians-University Munich, Germany

OFF-LABEL APPLICATION OF A 1.9MM SINGLE-USE ARTHROSCOPE F PEDIATRIC ENDOSURGICAL PROCEDURES – A PRELIMINARY REPORT

Oliver J. Muensterer, Noemi Wildschutz, Yannick Schmidt, Anne-Sophie Holler







OBJECTIVE – Recently, a novel **1.9 mm single-use arthroscope** (NanoScope ™, Arthrex, Munich, Germany) became available on the market. We have used the device **off-label for a variety of pediatric endosurgical indications** to facilitate nearly-scarless operations in children. This study **reports our prelimilary experience** with the new instrument.

METHODS AND PROCEDURES – A **retrospective review** of all cases performed in our department using the 1.9 mm single-use arthroscope for laparoscopy was performed from its introduction in August 2023 onward. **Types of procedures, patient demographics, quality of visualization, operative time, complications, and outcomes were recorded.**

RESULTS –A total of 29 procedures were performed using the NanoScope device. These included **22 inguinal hernia (IH) repairs** (see figure 1, table 1, 17 unilateral, 5 bilateral), 3 explorations for **cryptorchidism**, 2 laparoscopically aided **colostomy** creation, 1 **hydrocele** repair, and 1 endoscopic **pilonidal sinus treatment**. Median patient age was 2.2 years (range newborn to 14 years). The VGA (480x640) **resolution of the NanoScope was lower** than for standard contemporary endoscopy equipment.

Table 1 Inguinal hernia repairs	Demographics
n	22
sex	7 F / 15 M
Age at operation (months)	27 [2-118]
R/L/B	9 / 8 / 5

Median operative time was 30 minutes (range 13 to 121 minutes). Parameters for IH repairs in table 2. There were **no intraoperative complications, no recurrences of the hernias, and no postoperative opioid analgesics** were required. Upon 1 month follow-up, the access site for the endoscope had **healed without an appreciable scar** (figure 2).

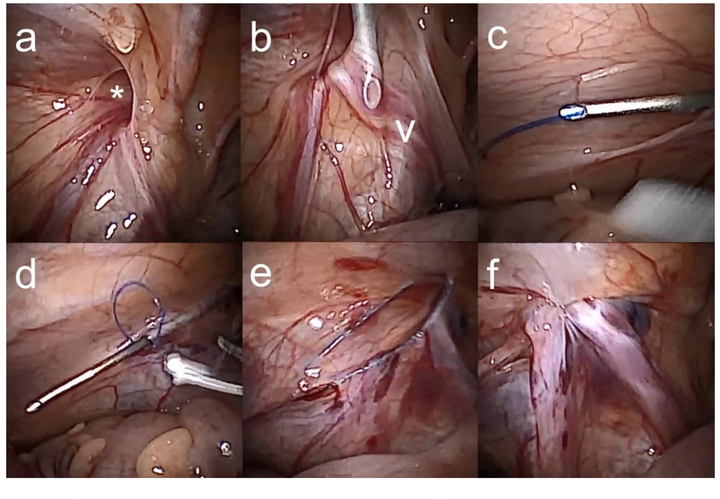


Figure 1: Inguinal hernia repair using the NanoScope. The internal inguinal ringarly visible (a, *). A Tuohy needle is percutaneously introduced to dissect over the vas deference (b, v). A loop of polypropylene is introduced into the abdomen (c), after which the lateral border is dissected (d). A second loop is pulled around the internal inguinal ring (e). Both strands of the second loop are tied tightly to close the hernia (f). Resolution is adequate to safely perform the procedure.

CONCLUSION AND FUTURE DIRECTIONS – Off label use of this novel, single-use **1.9 mm arthroscope facilitates nearly scarless laparoscopy in children**. Although the video resolution is lower than the current high-definition standard in most endosurgical cameras, the device allowed **adequate visualization to complete all the procedures safely.** Patients required minimal postoperative analgesics and had no adverse events. We intent to employ this technique for more pediatric endosurgical procedures at our center to prospectively gain more experience and explore the limits of the device.

Table 2 Inguinal hernia repairs	Intra-OP and outcomes
OP time (min)	26 [21-121*]
Complications	0
Recurrence	0
Follow up (months)	8 [1-18]

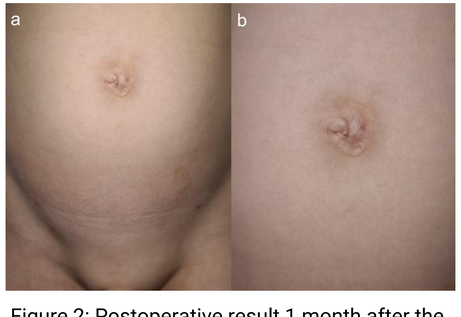


Figure 2: Postoperative result 1 month after the procedure (a). The umbilical incision is nearly unnoticeable (b).