New technique in pediatric surgery

Laparoscopic Single-channel Varicocele Dissection (LEVD)

Technique · Instrument Set · Implementation
The technique presented below is a new surgical procedure in pediatric surgery. By contrast with previous laparoscopic procedures, the surgeon only uses one port through which the telescope and instrument set can be inserted. A compact Operation Set was created for this innovative method in the course of cooperation between PD Dr. med. Ulf Bühligen and Richard Wolf.

Indication
Varicocele testis occurs in approximately 5 - 10% of young children during the growth phase. The varicocele is mainly located on the left-hand side. The cause is regarded as increased hydrostatic pressure with impaired drainage in the testicular veins where they join the left renal vein. Clinically the patient presents with thickened venous convolutes in the funicular part. There may also be a dragging ache in the relevant groin region.

Diagnosis
The diagnosis includes clinical investigation, ultrasound of both testicles with a comparison of both sides and Doppler vascular imaging with Valsalva’s manoeuvre. Dilatation of the network of testicular veins with verification of reverse blood flow within one second provides the indication for surgical intervention.

Method
The various procedures for varicocele surgery are directed toward preventing flow or closing off all malfunctioning veins. Laparoscopic transabdominal vascular transection is currently the intervention of choice. We have selected the laparoscopic, one-hand single-channel technique (individual trocar technique, 5.5 mm operation laparoscope with 3.5 mm working channel) in order to reduce the surgical trauma and provide a "scarless" method. The laparoscope is easy to manipulate with a convenient, clearly structured 3.5 mm instrument set.
**Instrument set**
Specially developed bipolar forceps are required for vascular dissection (with appropriate bipolar generator). A bipolar intervention allows a localized current to be applied to a small area and avoids compromising the neighboring structures. The option remains of expanding the intervention by using additional 3.5 mm working trocars and continuing to work with the same instrument set without restrictions. A suction and irrigation function maintains visibility in the surgical field.

**Result / Assessment**
The intervention is carried out as an out-patient procedure and is well tolerated by all patients. The 5 mm longitudinal incision in the patient’s navel leaves no visible scar behind. No wound healing disturbances or cheloid formation have been observed to date in the area of the scar. No neurological disturbances have been identified in the skin region during the course of post-operative follow-up checks, and no hydrocele has occurred. The ultrasound examinations comparing both sides showed good blood supply and development for the testes in all patients.
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**Initial preparation**
Local application of 2 ml 1 % Carbostesin. The skin incision is a longitudinal incision in the navel (mini-laparotomy). Gas insufflation up to 8 mm Hg is carried out via the 5.5 mm trocar. A 5.5 mm operating laparoscope with integrated 3.5 mm working channel (Richard Wolf) is used. Other access passages and working trocars are not needed.

**Assessment and positioning**
The abdomen is assessed, the varicocele side and the opposite side are inspected, the ductus deferens is identified. The patient is positioned slightly inclined to the right in head-down position.

1. **Incision**
The parietal peritoneum is opened using 3.5 mm scissors approximately 2 cm before the inner inguinal ring transverse to the direction of the vessels.

2. **Preparation**
The dissector is used to expose the vessels (veins and artery). Bipolar grasping forceps facilitate coagulation of all visible vessels (veins and artery).

3. **Coagulation**
The coagulation section should be at least 5 mm. Slightly raising the vessel branch avoids damaging structures of the abdominal wall with the bipolar current flow.

4. **Dissection**
The scissors can then be used to safely resect the entire vessel. If the inspection reveals further vessels, this procedure is repeated.
5. Completion
The operation is concluded with complete vessel dissection and visible distance between the vessels.

6. Wound closure
We use 3 x 0 Vicryl threads single button to close the peritoneum at the navel. We suture the main wound with 4 x 0 Vicrylrapid threads. We use short tension tapes positioned longitudinally over the wound as a wound dressing.

7. Healing
After one week, no scar can be seen.
Laparoscopic Single-channel Varicocele Dissection (LEVD)

Fiberoptic telescope with 50,000 pixel image guide for unsurpassed image quality given the overall instrument and channel size.

Irrigation or insufflation connector.

Light cable connection.

3.5 mm working channel for the use of 3.5 mm standard instrument set.

Extremely lightweight 5.5 mm plastic trocar sleeve with insufflation connector.

50,000 pixel image guide.

Light fibres.

3.5 mm working channel.

Newly designed bipolar jaw insert: specially offset jaw sections at the distal end provide reliable grip.
Laparoscopic Single-channel Varicocele Dissection (LEVD)

5.5 mm Surgical Laparoscope Set
comprising:
Surgical laparoscope with 3.5 mm working channel, 0° viewing direction, silicate image guide (8920.401), seal (8920.311), seal cap (15176.020), working length 215 mm ............. 8920.4011

Replacement membrane seals, yellow,
10 units................................. 89.103

Fiber light cable
2.5 mm, 2.3 m set............ 806625231

Reprocessing basket
for machine reprocessing and sterilization,
Dimensions (W x L x H):
131,5 x 471,5 x 74 mm .... 38044.211

Self-retaining plastic trocar sleeve,
5.5 mm, WL 105 mm, autoclavable, with insufflation stopcock, incl. membrane valve
89.103 (10 units) ..................... 8919.353
For introduction:
Trocar,
conical with blunt tip ............ 8919.3611
Trocar,
conical with sharp tip .......... 8919.3512
Trocar,
with pyramid-shaped tip ........ 8919.3513

Bipolar forceps
3.5 mm, cpl., WL 305 mm ............. 8391.743
Laparoscopic Single-channel Varicocele Dissection (LEVD)

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For further ERAGONmodular instruments see brochure "ERAGONmodular mini" B 796.