3.1 Inguinal hernia

3.1.1 Shouldice operation

This is an open surgical technique where the hernia, Derived from the Greek word “hérnos” (bud, sprout, protrusion). Hernia with congenital or acquired gap in the abdominal wall or diaphragm (hernial orifice) through which the peritoneum (hernial sac), possibly together with parts of the intestines, protrudes. gap is closed using tissue harvested from the patient himself. The surgeon removes a piece of skin, measuring around 5 to 8 cm and running crosswise, from above the inguinal ligamentLatin term: ligamentum inguinale. Reinforcement of a fascia in the lumbar region, which, inter alia, is fused with the aponeuroses of the oblique abdominal muscles and the transverse fascia. [Fig. 6], exposes the hernial sacEvagination of the peritoneum that protrudes through a hernial orifice. It may contain hernia contents. via this approach [Fig. 7] and opens it to check the structures contained in it, and if necessary treat it. Next, the abdominal contents are repositionReturn to its original site.ed in the abdominal cavityLatin term: cavitas abdominalis. The region of the trunk situated between the diaphragm and pelvis containing the abdominal organs. The abdominal cavity is lined with the peritoneum., the hernial sac is removed and the peritoneumA smooth layer of connective tissue that lines the abdominal cavity and covers most of the internal organs. sutured [Fig. 8]. To bestow better stability and strength on the posterior wall of the inguinal canalLatin term: canalis inguinalis. A canal measuring 4 to 5 cm long, running in the inguinal region through the abdominal wall. It originates at the internal inguinal ring and leads into the external inguinal ring. The lymph vessels and, in the male, the spermatic cord with the seminal duct and, in the female, the round ligament of the uterus pass through the inguinal canal., the inguinal ligament is sutured to the transverse fasciaLatin term: fascia transversalis. Fascia running crosswise between the peritoneum and the inner surface of the abdominal wall. [Fig. 9]. This suture is composed of several rows for greater safety [Fig. 10].

The Shouldice operationOpen surgical technique without mesh implant to treat inguinal hernias. is used primarily for smaller hernia openings and is normally conducted under general anaesthetic, but can also be performed using spinal anaesthesiaInjection of a locally active anaesthetic into the fluid-filled area surrounding the spinal cord; in abdominal operations this is administered at the level of the lumbar spine to suppress pain and touch sensations in lower innervated regions of the body. or local anaesthesiaLocally confined pain suppression that does not affect consciousness..
Fig. 6 and 7: Skin incision and exposure of hernial sac (Shouldice)
Fig. 8: Suture closure of abdominal wall

The anterior tissue structures (skin, subcutaneous adipose tissue as well as muscle layers) enclosing the abdominal cavity. (Shouldice)
Fig. 9: Suturing of inguinal ligament to transverse fascia
3.1.2 Lichtenstein operation

This is an open surgical technique where the hernia is cut open surgically. Hernia is derived from the Greek word “hérnos” (bud, sprout, protrusion). Hernia is a congenital or acquired gap in the abdominal wall or diaphragm (hernial orifice) through which the peritoneum (hernial sac), possibly together with parts of the intestines, protrudes. The gap is closed using a synthetic mesh. For some surgical techniques used to treat hernias, an artificial mesh is implanted for additional stabilization of the tissue in the region of the hernial orifice. The surgeon removes a piece of skin, measuring around 5 to 8 cm and running crosswise, from above the inguinal ligament. [Fig. 11], exposes the hernial sac. Evagination of the peritoneum that protrudes through a hernial orifice. It may contain hernia contents. Via this approach [Fig. 12] and opens it to check the structures contained in it, and if necessary treat it. Next, the abdominal contents are repositioned. The hernial sac is removed and the peritoneum is sutured [Fig. 13]. Then the surgeon covers the hernial orifice. Gap in the abdominal wall or in the diaphragm through which the peritoneum, possibly together with parts of the intestines, protrudes. with a synthetic mesh [Fig. 14], which is then sutured to the inguinal ligament [Fig. 15] and to the oblique lateral abdominal muscle [Fig. 16].

The Lichtenstein operation is used for large hernia openings or in the event of multiple recurrence. Relapse or onset once again of a disease. The most common type of hernia with hernial orifice above the inguinal ligament in the region of the lateral or medial inguinal fossa (Latin term: fossa inguinalis)
lateralis[/no-glossary]/medialis). See also lateral inguinal hernia and medial inguinal hernia.s (recurrent hernias). This operation is normally conducted under general anaesthetic, but can also be performed using spinal anaesthesiaInjection of a locally active anaesthetic into the fluid-filled area surrounding the spinal cord; in abdominal operations this is administered at the level of the lumbar spine to suppress pain and touch sensations in lower innervated regions of the body. or local anaesthesiaLocally confined pain suppression that does not affect consciousness..

Fig. 11 and 12: Inguinal incision and opening of the hernial sac (Lichtenstein)
Fig. 13: Suture of the peritoneum (Lichtenstein)
Fig. 14: Covering of the hernial orifice with a synthetic mesh (Lichtenstein)
Fig. 15: Suturing of mesh to inguinal ligament (Lichtenstein)
3.1.3 TAPP

TAPPSee Transabdominal Preperitoneal (Repair). (Transabdominal Preperitoneal Repair) is an endoscopic or minimally invasive surgical technique. With this technique, a small incision is made at the lower margin of the navel. A special needle is introduced into this hole and the abdomen, belly, is filled with gas in order to press back the intestines and enable the surgeon to get a good view of internal structures. Next, a camera is introduced through the same hole and via two further small incisions on the right and left of the navel surgical instruments are introduced [Fig. 17]. After cutting through the peritoneum, a smooth layer of connective tissue that lines the abdominal cavity and covers most of the internal organs. [Fig. 18], the hernial sac, Evagination of the peritoneum that protrudes through a hernial orifice. It may contain hernia contents. is carefully removed from the hernia, Derived from the Greek word “hérnos” (bud, sprout, protrusion). Hernia with congenital or acquired gap in the abdominal wall or diaphragm (hernial orifice) through which the peritoneum (hernial sac), possibly together with parts of the intestines, protrudes. orifice and then a sufficiently large synthetic mesh, For some surgical techniques used to treat hernias, an artificial mesh is implanted for additional stabilization of the tissue in the region of the hernial orifice. is unfolded and placed over the hole ([Fig. 19]. In general, meshes measuring at least 15 x 10 cm are used. The peritoneal opening is closed again with a suture [Fig. 20] to ensure that the mesh will not come directly into contact with intestinal loops (danger of it becoming stuck to these (causing adhesions).

If a bilateral hernia is present, both hernias can be treated in a single procedure. TAPP is used in particular for bilateral hernias as well as for recurrent hernias following previous open surgery. General anaesthesia is needed for endoscopic or minimally invasive surgery of inguinal hernia, The most common type of hernia with hernial orifice above the inguinal ligament in the region of the lateral or medial inguinal fossa (Latin term: [no-glossary]fossa inguinalis lateralis[/no-glossary]/medialis). See also lateral inguinal hernia and medial inguinal hernia.s.
Fig. 17: Introduction of trocars (TAPP)
Fig. 18: Incision of peritoneum (TAPP)
Fig. 19: Fitting of synthetic mesh (TAPP)
3.1.4 Total extraperitoneal repair (TEP)

With this procedure, the abdominal cavity Latin term: cavitas abdominalis. The region of the trunk situated between the diaphragm and pelvis containing the abdominal organs. The abdominal cavity is lined with the peritoneum. is not opened. Hence, the risk of injury to internal organs, such as the intestines, is virtually zero. Via a small skin incision beneath the navel, a small balloon filled with air is inserted between the abdominal wall The anterior tissue structures (skin, subcutaneous adipose tissue as well as muscle layers) enclosing the abdominal cavity. and peritoneum A smooth layer of connective tissue that lines the abdominal cavity and covers most of the internal organs. so as to separate these two layers from each other [Fig. 21]. The gap thus created is further enlarged by introducing carbon dioxide (CO₂) for expansion of wall structures and better visibility [Fig. 22]. Via two other small skin incisions a working instrument and camera are introduced [Fig. 23 and Fig. 24]. The surgeon can now carefully expose the hernial sac Evagination of the peritoneum that protrudes through a hernial orifice. It may contain hernia contents. and reposition Return to its original site. the hernia contents The components of the abdominal cavity, such as intestines or greater omentum, contained within the hernial sac. in the abdominal cavity. A synthetic mesh For some surgical techniques used to treat hernias, an artificial mesh is implanted for additional stabilization of the tissue in the region of the hernial orifice. is introduced via the hernia Derived from the Greek word “hémos” (bud, sprout, protrusion). Hernia with congenital or acquired gap in the abdominal wall or diaphragm (hernial orifice) through which the peritoneum (hernial sac), possibly together with parts of the intestines, protrudes. opening and, if necessary, this is further secured by means of a suture, tacks or tissue glue. But even without any fixation, the mesh rests firmly in place thanks to the naturally prevailing internal abdominal pressure The pressure prevailing inside the abdomen; this can be raised through coughing or pressing. [Fig. 25].

General anaesthesia is needed for endoscopic or minimally invasive surgery of inguinal hernia The most common type of hernia with hernial orifice above the inguinal ligament in the region of the lateral or medial inguinal fossa (Latin term: [no-glossary]fossa inguinalis lateralis/[no-glossary]medialis). See also lateral inguinal hernia and medial inguinal hernia.s.
Fig. 21: Insertion of balloon (TEP See Total Extraperitoneal (Repair).)

Fig. 22: Inflation with carbon dioxide (TEP)
Fig. 23 and 24: Introduction of trocars (TEP)
Fig. 25: Fitting synthetic mesh (TEP)

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