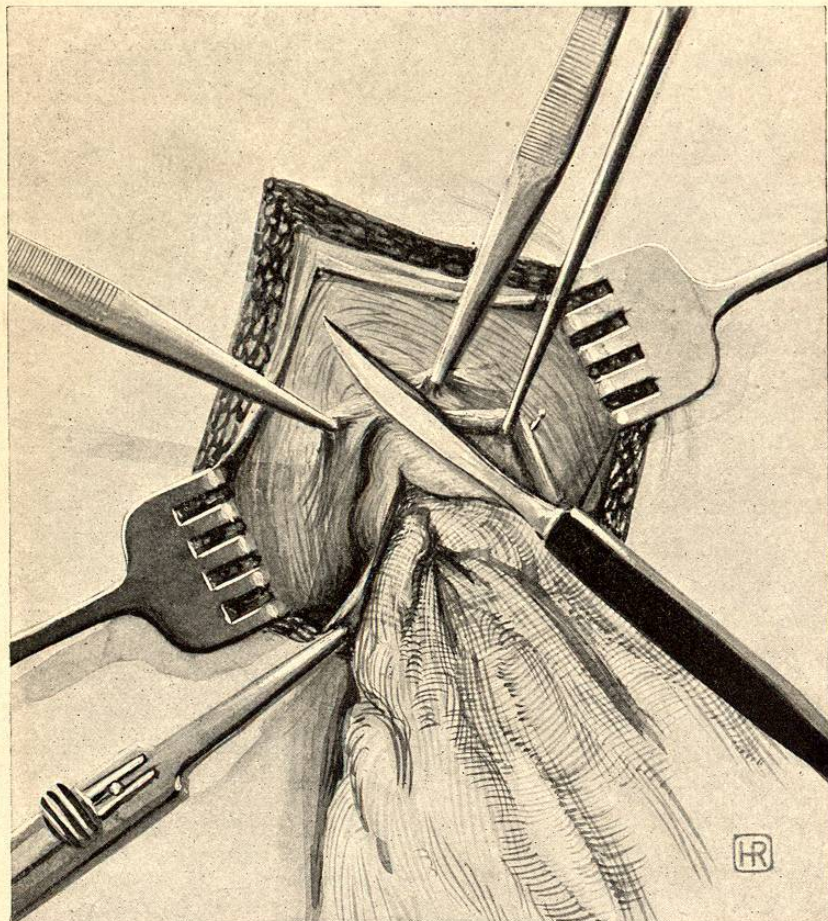


which lies in the subperitoneal tissue. He then closes the hernial ring in a peculiar way which brings the walls of the canal close together. Autopsy reports show that this pad of peritoneum becomes completely absorbed, and in the author's opinion the good results of the operation are not so much due to invagination of the sac as to the efficient nature of the suture of the hernial ring. The efforts to close the hernial ring

FIG. 231.

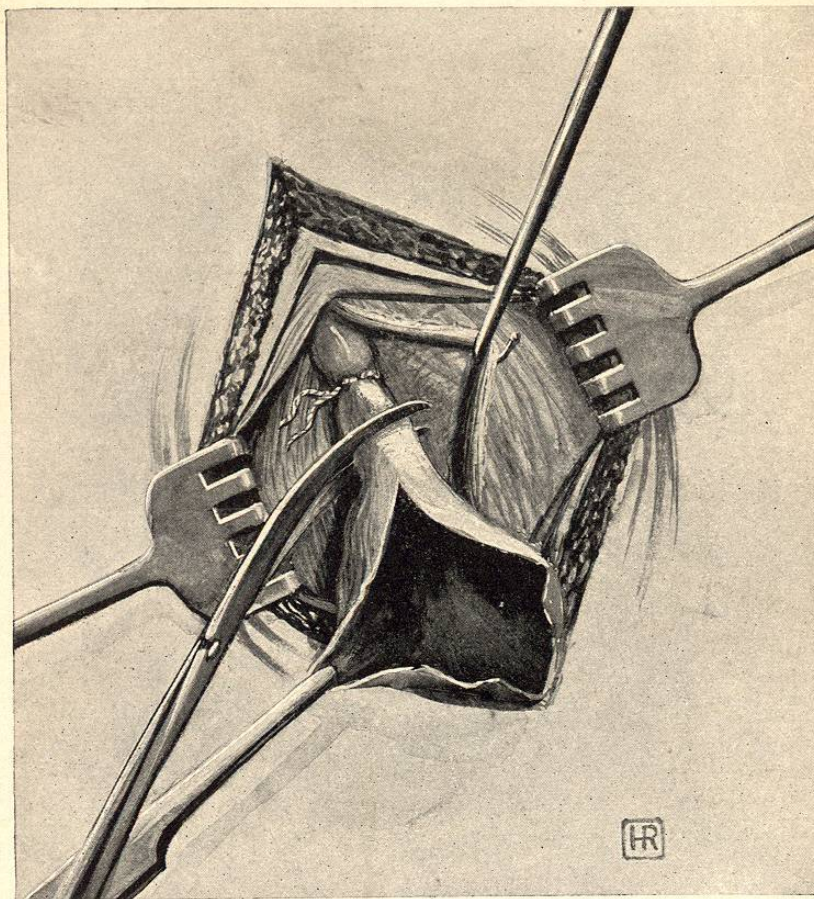


The constricting tissues are being divided and the anterior wall of the inguinal canal slit up toward the internal ring. The gauze packing prevents prolapse of the abdominal viscera. (Lilienthal.)

with some organic material always met with the same result. The material becomes atrophied after a certain length of time, and this contraction favors recurrence. There are other methods of transplanting the hernial sac, such as those of Kingscote, Bishop, and Phelps. The author objects still more to the methods that leave the sac in the hernial ring as a plug. (Julliard, Terillon, Fergusson.)

Bassini's operation endeavors to restore the inguinal canal, whereby the posterior wall is made up of a muscle layer that is sewn together as tightly as possible. The skin-incision is made over the entire inguinal canal extending a little beyond the internal ring. The aponeurosis of the external oblique is exposed and split upon a director. The fascia is turned back and the cord, with the neck of the sac, is lifted

FIG. 232.

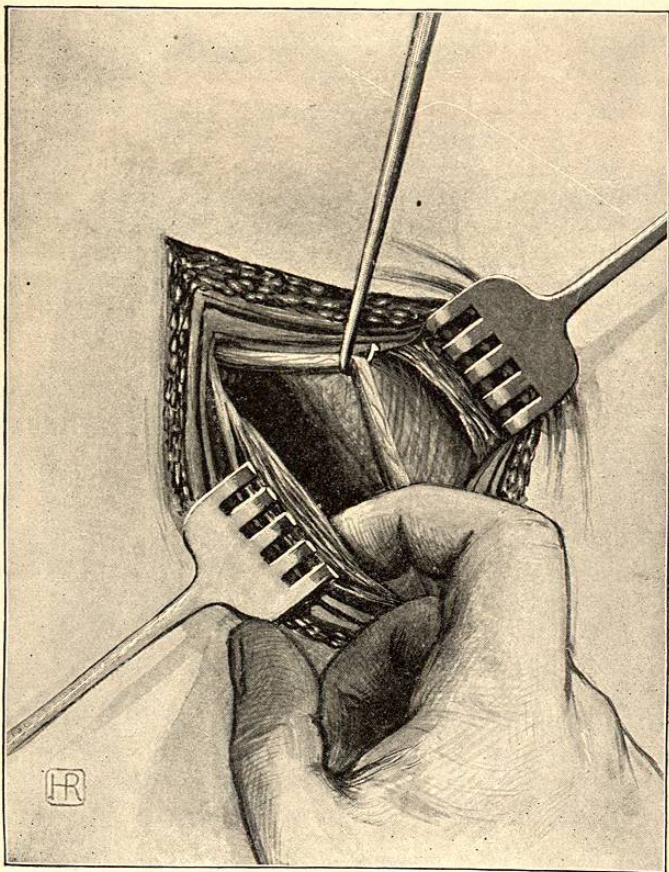


Its neck having been ligated, the sac is being ablated. The anterior wall of the inguinal canal has been opened. (Lilienthal.)

out. The cremaster is divided and the cord separated from the sac. No sharp instruments can be used, and the sac should be freed as far as the parietal peritoneum. If there is considerable difficulty in getting the sac off, the peripheral portion may be split and left in the scrotum. After opening the sac the hernial contents are reduced, the neck of the sac twisted once and transfixed; it is then tied off on both sides. When

the sac is very large or contains the cæcum, colon, or bladder, it is best not to use torsion, and to close the neck by means of a pucker suture. The stump should slip back readily into the abdominal cavity and not adhere to the margins of the ring. The cord is retracted upward and outward, and the fat and connective tissue are removed from the canal. The lower free margin of the internal oblique and transversalis are united by

FIG. 233.

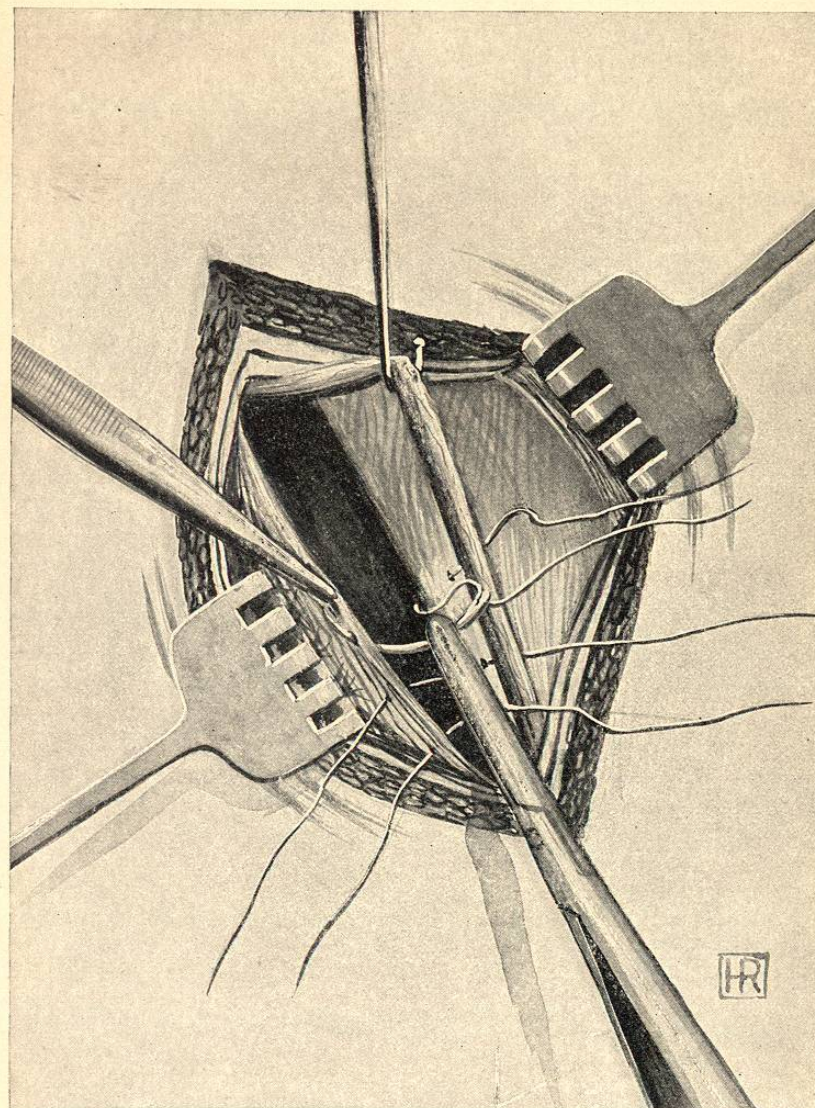


The ligated neck of the sac has retracted. The edge of Poupart's ligament is held back by the sharp retractor, exposing its under surface. The finger is feeling for the external iliac artery. The other sharp retractor holds the skin and aponeurosis, exposing muscle and conjoined tendon. (Lilienthal.)

interrupted silk sutures to Poupart's ligament, which is put under tension by pulling on the lower portion of the aponeurosis of the external oblique. The sutures should start low down, close to the spine of the pubes, and if possible the periosteum of the bone should be included in the first stitch. The stitches should be all placed and then tied from below upward, and enough space left at the top to allow the cord suffi-

cient room. The sheath of the rectus abdominalis may also be included in the first stitch, provided this can be done without too much tension. No space should remain between Poupart's ligament and the lower

FIG. 234.

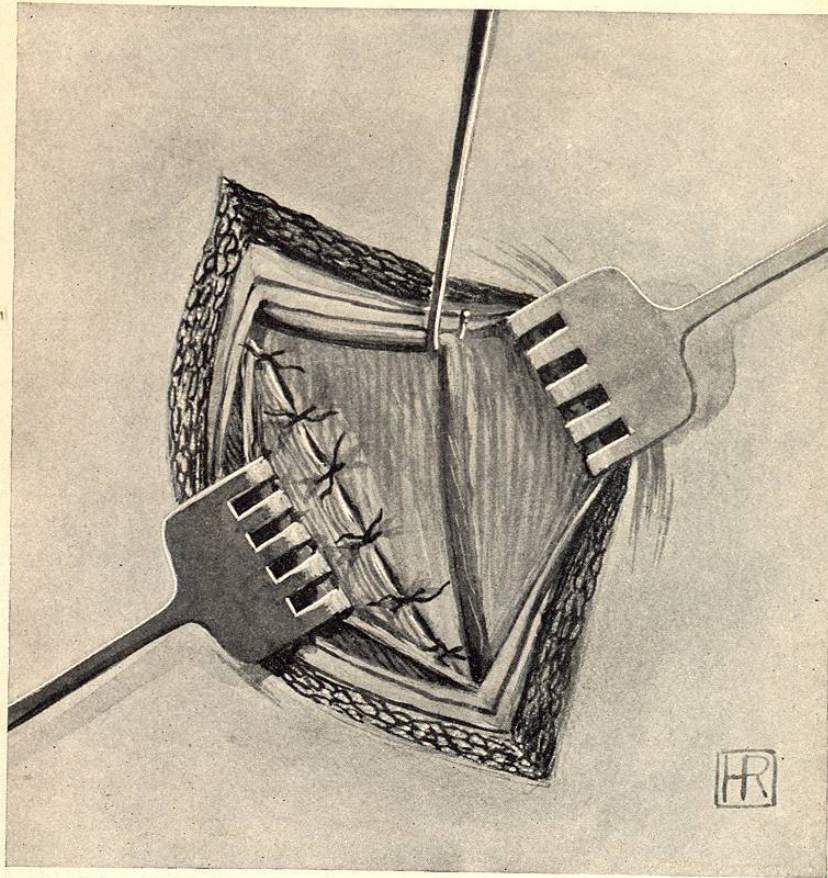


Passing the deep, important sutures through the conjoined tendon and the inner side of Poupart's ligament exposed by the retractor. The cord is held out of the way. (Lilienthal.)

margin of the muscle. This is frequently easy, but may be very difficult when the muscle is thin or deficient, or when the space to be cov-

ered is very broad. The cord is then put in place and the fasciæ of the external oblique sewn together with interrupted stitches. The skin-wound is then closed without drainage. The aponeurosis should be sewed very carefully. The edges should just touch, and not roll in or out, nor should the stitches be tied too tight, because this tissue is not freely supplied with blood and is liable to slough. Bassini's first report

FIG. 235.



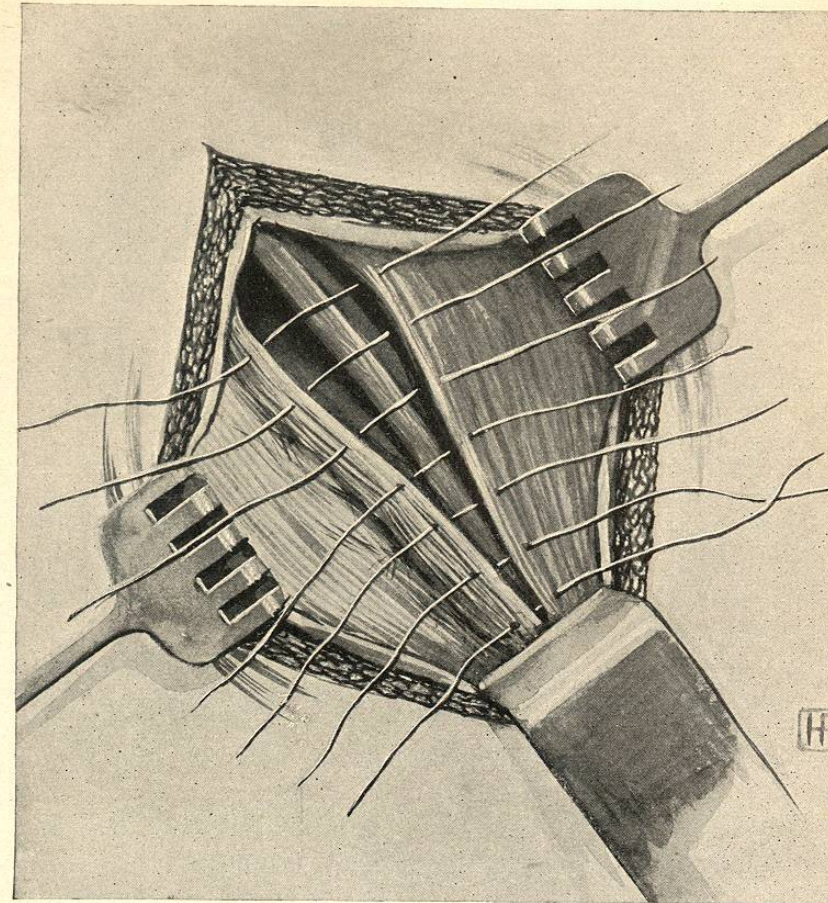
Deep sutures tied, forming new posterior wall for the inguinal canal. (Lilienthal.)

included 262 cases of inguinal hernia, 11 of which were strangulated. One of these died on the fifteenth day from pneumonia. The local condition had healed. There were 7 recurrences. The patients were not allowed to wear a truss.

Other similar methods have been recommended. In the course of time Wölfler passed the testicle through the space between the two recti muscles. Frank placed the cord in a bony canal chiselled out of the pubes. Ferrari, Magnai, and Postenski have also recommended meth-

ods of their own. Kocher's method shows good results and the technic is simple. The skin-incision is made parallel to Poupart's ligament about 1 cm. (0.4 inch) above this, and reaches to the outer third. The aponeurosis of the external oblique is exposed and the sac isolated up to its point of entrance into the abdominal cavity. It is completely

FIG. 236.



Cord lying on wall formed by deep sutures. Superficial sutures pass through the edge of the aponeurosis and the edge of Poupart's ligament. Note where the ligament is drawn in by the deep sutures. (Lilienthal.)

separated from the scrotum. An incision is made through the external oblique about 1 cm. (0.4 inch) beyond the internal ring and in the direction of the muscular fibres. A pair of curved forceps are passed in through this opening down the inguinal canal, guided by a finger, and in front of the cord. The tip of the free hernial sac is grasped and pulled back out through the small opening above. The neck of the

sac is sewed into the incision with silk sutures, and the sac itself is removed. The canal is closed by passing silk sutures through the aponeurosis of the external oblique, internal oblique, and transversalis, and sewing these structures down to Poupart's ligament. The cord must be protected with a finger or spatula and pulled down and kept under tension. The canal is closed until there is just room enough left for the cord. The method is simple and has the advantage that the external oblique is not split.

Kocher has recently described an invagination method, which is similar to the above up to the point where the hernial sac is isolated. The tip of the sac is then grasped with a pair of forceps and invaginated through the canal, and the forceps with the invaginated sac pressed against the abdominal wall outside and above the internal abdominal ring. An incision is made through the abdominal wall to the forceps and the sac with the parietal peritoneum is pulled out through the opening. The parietal peritoneum is then slit and held in place with clamps. The sac is put under considerable tension, crushed at the base, transfixed, and tied off. After removing the sac and replacing the stump the opening in the aponeurosis of the external oblique is closed with the same stitch. The canal is closed in the same way as already described. The average stay of the patients in bed is ten days.

Girard's method is especially adapted to large hernias with lax abdominal walls. The skin and aponeurosis of the external oblique are divided just as in Bassini's operation, except that care is taken to leave a strip of aponeurosis of about the width of a finger along Poupart's ligament. After treating the sac in the usual way the internal oblique and transversalis are sewed to the under surface of Poupart's ligament with a continuous stitch. The upper portion of the external oblique aponeurosis is also sewed to the deep portion of Poupart's ligament, and the lower portion is sewed to the external surface of the upper portion about 1.5 cm. (0.6 inch) from the margin, so that the aponeurosis is doubled for a certain distance. A small space is left below to allow for the cord, while the skin is closed by a continuous stitch.

Schede has recommended the use of buried silver wire for the purpose of closing the inguinal ring. Witzel made use of wire netting that healed in place sometimes in spite of suppuration. Götel recommends a similar method, and Trendelenburg and Kraske made a flap of bone and periosteum from the pubes, which was turned upward.

The accidents that may happen during a radical operation are: injury of the bladder, which may be fatal if not recognized early; or the spermatic cord and the vas deferens may be torn, an accident that may be followed by atrophy or gangrene of the testicle. Extensive resection of the omentum is frequently followed by hemorrhage if the ligatures are not applied with great care. In individual cases it has also been followed by more or less fixation of the intestine associated with symptoms of obstruction, due to strangulation beneath bands or

due to torsion or new adhesions. These accidents are not common, but should be recognized early and treated with timely laparotomy. If the bleeding in the wound is not accurately stopped, there is liable to be suppuration which is usually superficial, but even when deep, peritonitis is not liable to occur. Suppuration interferes greatly with the chances of a permanent cure. It is very annoying to have silk thrown off long after the operation, although individual accidents of this sort should not lead one to be satisfied with catgut, because this is absorbed too rapidly. Opinions differ, however, on this point. The severest complications are the small foci of bronchial pneumonia that develop insidiously and announce themselves only as a certain increase of respiration with a sense of oppression. This condition is especially to be feared in old people with bronchial catarrh, also in individuals with emphysema, in patients with heart disease, and in alcoholics. The prognosis, of course, differs considerably with the age of the patient, with small and large hernias, with old and recent ruptures, in strong and feeble individuals, and when the hernia is single or multiple. At the present day the consensus of opinion seems to be that no appliance should be worn after an operation that has been successful in every way and where the prognosis is favorable. When the hernia has been very large, and there has been at the start some probability that it might recur, it may be advisable to wear a smooth spica bandage for a certain length of time. The patients should be examined within a few months after operation, and if there is any tendency to recurrence the condition should be held within bounds as much as possible by a bandage. The mortality in the last ten years has sunk to about one-tenth of what it formerly was. The results, of course, are better with surgeons who operate chiefly on young and healthy individuals. Up to twenty years ago the mortality was about 25 per cent.; ten years ago it was 5 per cent. At the present time the death-rate varies in the hands of different authors between 1 death in 700 operations up to 1 per cent. The results in young children are very favorable. Broca performed 450 operations on children under fifteen years of age, with 1 death. Fränkel reports 16 operations on infants.

At the present time only about 10 per cent. of the cases show recurrence, although the figures are not so reliable as the statistics on mortality, because the patients themselves were not examined and personal statements or communications by letter were taken as evidence. The majority of recurrences appear within the first six months after operation, especially if the patients resume their former occupation. Bassini's communication in 1890 included 462 operations with 3 per cent. of recurrences; 77 of the patients operated on in Albert's clinic showed 2.7 per cent. of recurrences; Championnière operated on 650 patients, with 21 recurrences; Berger operated upon 350 cases, with 10 recurrences; Rotter operated upon 122 cases, and had 1.5 per cent. of recurrences. Similar results are reported by other authors.