INGUINAL HERNIOPLASTY WITH MINI INVASIVE ACCESS

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Abstract

In modern herniology, the application of prosthetic techniques with a predominant share of anterior access is expanding. When using these techniques, the recurrence rate is clearly reduced, but the percentage of patients with late postoperative chronic groin pain is relatively high. The possibility of reducing unwanted results and improving the quality of life among operated patients has necessitated the improvement of operative techniques and the creation of new ones. Modern prosthetic meshes are widely used in herniology: the so-called lightweight meshes and composite meshes with a resorbable component to reduce foreign material in the body.

Despite its simplicity and versatility, Lichtenstein's operation is not without its drawbacks. With this method, recurrences are not excluded. They develop in the unprotected areas of the back wall of the inguinal canal. Recurrences usually occur between the transversal fascia and the prosthesis in the area of the tub. pubicum or through the internal opening of the canal.

Key words: *inguinal hernias, mini access, modified operative method of Lichtenstein.*

Objective

To compare the two operative methods Lichtenstein's and our combined operative method.

Materials and methods

Data were collected and stored from the surgical treatment of 117 patients operated on for inguinal hernias in 2014-2019 in the Department of Surgery of MHAT "Parvomai", Parvomai. The average age of the operated is 65.7 years., 8 women and 109 men, all were operated on in a planned manner. The operated men were divided into two groups: the first group of 52 and the second group of 57 people. First group (n=52) is operated on our modified Lichtenstein technique with mini access. Second group (n=57) is operated according to Lichtenstein with a standard parainguinal incision. Variation and correlation analysis of early and late complications for a period of 12 to 24 months was applied.

Operative method

We use for mini-access a horizontal Felice skin incision with a length of 5 cm. According to many authors, this incision has many positive aspects in terms of access in depth. It begins medially and below the spina iliaca anterior superior in a horizontal direction, crosses the projection of the internal opening of the inguinal canal and ends above the external. This incision passes into a more avascular zone, is parallel to Langer's lines, spares the cutaneous femoral nerves and their origin, and can be expanded bilaterally. It gives very good access to the area of the external opening of the inguinal canal and the upper-internal part of the inguinal region. It is accepted that it is possible to perform hernioplasty by various methods.

In this operative method, additional strengthening of the internal opening and plication of the transversal fascia is performed before fixation of the polypropylene mesh. In principle, the implant can be used to reinforce the already sutured hernial neck. In this combined technique, the inguinal area is reconstructed. Restoring the normal topographical-anatomical relationships of the tissues and strengthening them increases their ability to resist the increased intra-abdominal pressure, as well as the strength and functionality of the

hernioplasty. The polypropylene mesh even under tension of the seams from below prevents them from cutting.

Highlights: Reduced transverse skin and subcutaneous incision. Reinforcement of the back wall. Excision of the implant in situ and fixation with absorbable sutures. A neuroprotective procedure. Local anesthetic infiltration into the operative field for postoperative analgesia. Early mobilization and discharge. General anaesthesia or lumbar, with a short-acting medication Lidocain.

Short transverse incision in the inguinal area with a length of 4-5 cm. Longitudinal opening of the inguinal canal, luxation of the cord, identification of nerves and hernial sac, its minimal preparation and processing, ligation with excision or intussusception. Next is reinforcement of the posterior wall of the inguinal canal as in the Shouldice technique. With a continuous suture with resorbable Vicryl 2/0 thread, starting from the tub. pubicum by suturing from medial to lateral the tendinous arch of m. transversus abd. to tr. ileopubicus and the internal opening of the canal is reached. In the case of a wide inguinal triangle, mainly in direct hernias, in order to avoid tension, we use a relaxing incision of Halsted, along the anterior wall rectus abdominis muscle.

After that, a polypropylene mesh measuring 7.5x15 cm is implanted, and at the beginning one of the long sides is fixed to the tub. pubicum and lig. inguinale with three sutures – the first to tub. pubicum with an overlap of 1 - 1.5 cm, the second in the middle and the third at the level of the internal opening. The medial edge of the prosthesis is fixed with three n-shaped ligatures, passed and fixed on the medial wing of the fascia of the obl. abdominis externus. We use for this hernioplasty VyproII - synthetic, knitted, semi-absorbable canvas, consists of 50% knitted Vicryl threads with a coating and 50% Prolene, does not unravel during "cutting and cutting", has macropores-3-5mm., thanks to which it is not encapsulated, but incorporated, elastic and "obedient" - moves with the abdominal wall, partially resorbs - 70% less foreign body after about 60 days compared to polypropylene.

Fixation of the prosthesis proximal from the internal inguinal opening to the underlying muscles is avoided because of the risk of entrapment in the sutures of the nerves and inguinal area. All fixation of the mesh is done only with resorbable thread Vicryl 3/0. With adequate identification of the three nerves in the inguinal canal, we strive to keep them out of contact with the mesh, but with poor identification and danger of their getting caught in the sutures, in adult patients we prefer neurectomy.

We avoid fixation of the mesh with non-absorbable suture, due to the proven shrinkage of the prosthesis by 30-40% by the end of the first year and the cutting of the fixation sutures through the fascial structures, which would lead to their weakening and the possibility of recurrence. The cordon is placed over the prosthesis and the inguinal canal is closed. After closing it, we infiltrate inside Lidocain 100 mg 10 ml., with the same amount of local anaesthetic we infiltrate the subcutaneous tissue and skin for postoperative analgesia and restore them layer by layer with the same suture material. No additional anaesthesia is usually required. Early mobilization follows, at the 6th hour after the operation and discharge from the hospital the same or the next day.

Results

The length of the incision in patients from both groups varied depending on the type of hernia and the severity of subcutaneous fat. Patients in the main group initially had an incision 5 cm long and, if necessary, expanded to 6.5 cm, which was enough to complete the operation. According to the length of the surgical access, all patients are distributed in table No.1.

Type of hernia according to Nyhus L.M.	Main group (n=52)		Control group (n=57)		p
	n	M±m	n	M±m	
Type II, Type III-B	28	5,28±0,2	24	8,43±1,0	p<0,05
Type III-A	17	5,25±0,2	27	8,77±0,9	p<0,05
Type IV – A-B-D	4	5,25±0,2	2	9,97±0,9	p<0,05
Bilateral hernia	3	5,25±0,2	4	8,75±0,5	p<0,05
Average cut length	5,3±0,2		9,4±1,0		p<0,05

Table No.1 Distribution of patients from the two groups according to the length of the surgical incision.

The length of surgical access, regardless of the type of hernia according to Nyhus LM, in the main group was on average 5.3 ± 0.2 cm, in the control group - 10.4 ± 1.0 cm, the differences were significant (p 0.05).

The duration of surgical interventions for different types of inguinal hernias is shown in table No. 2.

Type of hernia according to Nyhus L.M.	Main group (n=52)		Control group (n=57)		p
	n	M±m	n	M±m	
Type II, Type III-B	28	52,6±1,8	24	56,2±1,5	p<0,05
Type III-A	17	47,7±3,1	27	53,4±1,8	p<0,05
Type IV – A-B-D	4	46,6±6,0	2	55,4± 0,6	p<0,05
Bilateral hernia	3	77,5±2,5	4	91,2± 8,2	p<0,05
Average duration in min.	46,4±3,0		51,4± 2,4		p<0,05

Table No.2 Duration of surgical intervention

Analyzing the data shown in Table 2, no significant differences were found in the comparison groups, although the duration of the operation according to the method we developed was slightly less than the operation time according to the Lichtenstein method.

In the early postoperative period, the severity of pain is assessed. The assessment of pain is performed by the patient independently with a verbal rating scale (VRS) containing the following degrees: no pain - 0 points, feeling of discomfort - 1 point, minimal pain - 2 points, moderate pain - 3 points, severe pain - 4 points, intolerable pain -5t. According to the proposed 5-point rating scale, pain assessment was performed every 4 hours after surgery for two days. The intensity of pain in the early postoperative period in patients from both groups is shown in Table No.3.

	4 hours	12 hours	24 hours	36 hours

	main n=52	control n=14	main n=52	control n=14	main n=52	control n=14	main n=52	control n=14
0	n=5 9%	-	n=13 25%	-	n=21 40%	n=2 14%	n=33 63%	n=3 21%
1	n=30 57%*	n=3 23%	n=29 58%	n=5 36%	n=27 52%	n=9 64%	n=19 37%*	n=9 64%
2	n=17 34%	n=7 52%	n=9 17%*	n=8 57%	n=4 8%	n=3 22%	-	n=2 14%
3	-	n=4 25%	-	n=1 7%	-	-	-	-
average	1,2*	2,1	0,9*	1,7	0,7	1,1	0,3*	0,9

Table No.3 Intensity of pain in the early postoperative period.

Conclusions

The possibility of reducing unwanted results and improving the quality of life among operated patients has necessitated the improvement of operative techniques and the creation of new ones, the application of modern (so-called light) meshes and combined with a resorbable component in order to reduce foreign material in the body.

With the folding of the transverse fascia according to Shouldice, the closest to the natural modelling of the posterior wall and the internal inguinal opening is made. Anatomical strengthening of direct hernia sites is achieved, the inguinal space is reduced, and the cranio-caudal size of the internal inguinal opening is moderately reduced.

The debarrassing incision reduces the tension in the place of support of the hernioplasty. These anatomical changes improve the anatomic-functional protection of the back wall and the internal inguinal opening, while not disturbing the layered structure of the area.

The placed mesh further strengthens the weak points by creating the so-called "prosthetic aponeurosis" strengthening the hernial defect. The normal biomechanics of the area is preserved and it is gentle on the nerves passing through this area.

The created and approved modified Lichtenstein's mini-access operative method for the surgical treatment of inguinal hernias has proven safety in treatment - it reduces recurrences to 1.9% and reduces the rate of late postoperative chronic pain and improves the quality of life among operated patients.

Patients undergoing open mini-access surgery experience little discomfort and resume normal daily activities within two weeks.

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