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Modified NICH (Nigam's Inverted Curtain Hernioplasty) for Inguinal hernia – A foolproof Procedure for Recurrence

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Abstract

It is a procedure where NICH is modified with basic repair, 2 stitches approximating inguinal ligament with conjoint tendon. Hundred patients were operated between April 2012 to April 2022 by modified NICH technique. All were primary uncomplicated cases of inguinal hernia. Modified NICH procedure for inguinal hernia takes care of recurrence better than any other procedure for inguinal hernia. Though NICH is a good modification of tension - free Lichtenstein procedure for inguinal hernia but modified NICH further improves the results specialty the recurrence. Modified NICH hernioplasty gives added advantages of repairing posterior inguinal wall which directly influences the recurrence rate. In our series of 100 cases no post – operative recurrence was noted. Though the series described here is small so more cases and more time is required to further confirm the results.

Key words: Hernioplasty, Inguinal hernia, Modified NICH, NICH, Recurrence.

Introduction

Inguinal hernia is a common ailment. Inguinal hernia is the most common form of hernia. It is the protrusion of the abdominal contents through the inguinal region of abdominal wall. The inguinal region is a weak part in anterior abdominal wall. The weakness is due to presence of following structures in inguinal canal, these are inguinal canal, deep inguinal ring, and superficial inguinal ring. A semilunar D shaped gap exists beneath the arched fibres of internal oblique muscle, this area is filled by only transversalis fascia and it is the weak spot in inguinal region. Here, transversals fascia is the only restraint to herniation of the abdominal contents.[1] Direct inguinal hernia occurs here. Inguinal hernia is more common on right side.

Among inguinal hernias 65% are indirect inguinal hernia and 35% direct inguinal hernia. Fifty five percent inguinal hernias are right sided, 45% hernias are left sided and bilateral inguinal hernias are 12%. Five percent cases have both direct and indirect inguinal hernia (pantaloon hernia). Twenty two percent patients of unilateral inguinal hernia will develop contralateral hernia in life, as it is confirmed by laparoscopy. In infants with one sided inguinal hernia the processus vaginalis is patent on other side in 60% cases, if the other side is explored.[2] Males are more than 10 times more affected by inguinal hernia than females.

Indirect inguinal hernia is common in young and direct inguinal hernia is common in adults and elderly persons. Inguinal hernia in females is usually indirect inguinal hernia and direct inguinal hernia in females is rare. Inguinal hernia has approximately 10% incidence of incarceration. In children the recurrence rate is less than 10%. Indirect inguinal hernias are uncommon in baby girls as compared with baby boys (ratio 1:9).

In modified – NICH the NICH procedure is further supported by two nonabsorbahle sutures at the posterior wall of inguinal canal approximating inguinal ligament and conjoint tendon behind the spermatic cord like Bassini's repair. In our series we had few minor complications but no recurrence.

Material and Methods

We did a total of 100 modified – NICH procedures in inguinal hernia patients (primary unilateral uncomplicated indirect, direct and bilateral inguinal hernia) between March 2012 to March 2022 in Max Hospital, Gurgaon, Haryana, India.

All patients were diagnosed as cases of various types of inguinal hernia. Informed consent was taken from all patients. There were 95 male (95%) and 5 female (5%) patients in this series. Eighty three (83%) patients had right inguinal hernia 14 patients (14%) had left sided inguinal hernias and 3 patients (3%) had bilateral inguinal hernias. Indirect hernias were in 78 (78%) patients and direct hernias were in 22 (22%) patients. Most of the patients were operated under spinal anaesthesia (Table 1). All these patients were operated by same modified – NICH technique. All patients were prepared for operation and were operated under local, spinal or general anesthesia. Indirect inguinal hernia sac was transfixed and excised. Plication was done for direct inguinal hernia. The prolene sutures No1/0, were applied approximating inguinal ligament and conjoint tendon behind the spermatic cord. Then a polypropylene much of 15x15cm size was applied on this area.

Table 1: - Patients and hernia characteristics.

Total	**100**	**Percentage**
Mean age	53	53 %
Male	95	95 %
Female	05	05%
Right Side	83	83%
Left Side	14	14%
Bilateral	03	03%
Indirect inguinal hernia	78	78%
Direct inguinal hernia	22	22%
Under local anaesthesia	07	07%
Under spinal anaesthesia	70	70%
Under epidural anaesthesia	03	3%
Under general anaesthesia	20	20%

n = 100

After the skin incision, the external oblique aponeurosis was incised above the midline of superficial inguinal ring so as to help in semi double breasting of external oblique aponeurosis. The area where the mesh was to be placed (the mesh bed) was prepared by making space between external oblique aponeurosis and internal oblique muscle with index finger wrapped up with gauze. Similarly, the space on the medial and lateral sides was

also created. Care was taken to avoid injury to ileoinguinal, ileohypogastric nerves.

Two sutures were applied at a distance of 2 cm for one another, approximating inguinal ligament and conjoint tendon.

First suture, using 2-0 polypropylene suture, was applied at the fascia above pubic tubercle allowing 2 cm of mesh to go beyond it. Pubic tubercle bone was not pierced by needle. Second suture, using 2-0 polypropylene suture, was taken through the inguinal ligament just below the deep inguinal ring and the mesh. The lateral margin of the mesh was cut at two cm from the lower margin to make a slit. The spermatic cord was taken out from this slit making an artificial deep inguinal ring from the mesh. Third suture, using 2-0 polypropylene suture, was applied to the two crura of the mesh and internal oblique muscle. This third suture serves following purposes: narrowing of deep inguinal ring, formation of new deep inguinal ring of mesh, fixation of mesh to deep inguinal ring preventing recurrence. The newly formed ring fits snugly around the cord at deep inguinal ring thus preventing any protrusion of preperitoneal tissue and recurrence.

Finally, the mesh was pushed in the space made for it between the external oblique aponeurosis and internal oblique muscle.

The external oblique aponeurosis was then closed with 2-0 polypropylene suture in a semi double breasting manner.

The wound was closed in the conventional manner.

All patients were discharged within 24 hours. Ambulation was not restricted. Patients were advised to take oral antibiotics and analgesics for 3 to 5 days. Patients were called for follow-up (Table 2) on the 8th post-operative day. Sutures were removed on the eighth to tenth postoperative day.

Table 2: Patients demographics and post – operative course.

Completed follow-up for 4.5 to 5 years	7 (7%)
Completed follow-up for 2 years	69 (69%)
Completed follow-up for 12 months	8 (8%)
Completed follow-up for 4 months	7 (8%)
Completed follow-up for 21 days	9 (9%)

n = 100

Results

Post-operative discomfort (Table 3) was treated with antiinflammatory drug ibuprofen, 400 mg thrice a daily. Most patients took analgesics and anti-inflammatory drugs for 3-5 days. Ninety six patients (96%) returned to work from the 4th to 12th post-operative day depending on their occupation. This series of 100 operations by modified NICH showed no recurrence i.e., 0%, although a larger series is required to further strengthen the low recurrence following modified NICH. Two patients (2%) developed postoperative neuralgia which continued for 2-3 months after operation and then gradually subsided. The cause was not known. No case (0%) required removal of mesh due to infection or any other reason. No (0%) serious complication was observed in this series. It was found that most of the patients who developed minor haematomas and bruising were on aspirin.

Table 3: - Post – operative complications.

Post-operative discomfort for 2-3 weeks	3 (3%)
Seroma	1 (1%)
Minor haematomas	3 (3%)
Haematoma requiring surgery	0 (0%)
Minor wound infection	1 (1%)
Wound infection requiring surgery	0 (0%)
Bruising	1 (1%)
Neuralgia	1 (1%)
Recurrence	0 (0%)
Removal of prosthesis due to infection or other causes	0 (0%)
Stitch abscess	1 (1%)

n = 100

Discussion

Nigam's Inverted Curtain Hernioplasty (NICH) is a minimal dissection tension-free hernioplasty for inguinal hernias. It is based on the principles of Lichtenstein's tension-free hernioplasty. It is a simple technique using minimum number of sutures with least recurrence and complications. In this technique polypropylene mesh covers hernia prone area of inguinal floor with almost no tension at suture line.[1] Mesh is fixed at its lower part and rest of the mesh remains free like an inverted curtain. Third suture serves two purposes at the same time by narrowing the natural deep inguinal ring as well as making a new deep inguinal ring of the mesh by fixing the two crura of the mesh, this reduces the risk of recurrence. A semi-double breasting of external oblique aponeurosis is done to keep the mesh in place. This procedure can be done under local anesthesia or regional anesthesia.[2]

NICH leaves most of the mesh free and without sutures so as to avoid maldistribution of tension on the mesh and dead space formation. NICH enjoys the advantages of both the suture and suture less mesh hernioplasty. Less number of sutures has these advantages i.e., no nerve trapping, no maldistribution of tension, not much postoperative discomfort and when patient stands, walks and runs there is no tension on mesh. NICH has these advantages due to having the least number of sutures.[3, 4]

Modified NICH gives complete protection for recurrence as it strengthens posterior wall of inguinal area by approximating inguinal ligament and conjoint tendon as was used by Bassini. [5, 6]

Recurrences after operation has been a soaring point for various surgical repairs in inguinal hernia. Every surgeon wishes to reduce the recurrence after surgery. Lichtenstein [7, 8] developed his tension free technique to reduce incidence of recurrence.

Israilsson LA etal give importance to the technical failure for recurrence, "we know that a percentage of recurrence in adults after hernia repair is due to collagen disorder. Considering the recurrence a problem of biology and collagens, one should not neglect technical failures directly leading to a poor outcome".[9]

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