



## Modified NICH (Nigam's Inverted curtain hernioplasty for inguinal hernia)

Vinod Kumar Nigam, Siddharth Nigam

Department of General and minimal Invasive Surgery, Max Hospital Gurugram, Haryana, India

### Abstract

The treatment of a hernia is done by a surgical procedure. The recurrence after hernia surgery is the most important factor for the patient as well as for the operating surgeon. NICH is a good method of inguinal hernia repair with minimal recurrence. The modified NICH further reduces the incidence of recurrence to almost zero. The modified NICH for inguinal hernia is a combination of NICH with partial Bassini's repair. This procedure gets the benefit of both procedures i.e. NICH and Bassini's repair. The Bassini's repair is done partially here and not complete. The modified NICH procedure is easy, economical, effective, and easy to learn. This procedure even can be done under local anaesthesia at a village level hospital. The learning curve of this method is small.

**Keywords:** Bassini's repair, inguinal hernia, Nigam's inverted curtain hernioplasty, recurrence

### Introduction

Inguinal hernia is the most common hernia among abdominal wall hernias. According to some authorities; 73% are inguinal hernias, 17% are femoral hernias, 85% are umbilical hernias (congenital, infant, adult and paraumbilical hernias) and 1.5% are rare hernias. Incisional hernias are excluded.

Groin hernias constitute 75% of all abdominal wall hernias. Groin lumps are swellings which account for about 10% of general surgical out patient referrals<sup>[1]</sup>.

Hernia was mentioned in the Egyptian papyrus of Ebers in 1552 BC. Hippocrates (460-373 BC) described umbilical hernia. Hindus were known to use an abdominal or a preperitoneal approach for cases of strangulated hernia<sup>[2,3]</sup>.

Approximately 20 million hernia operations are performed every year worldwide. It is estimated that 5% population will develop abdominal wall hernia in their lifetime. Approximately 7,50,000 inguinal herniorrhaphies are performed every year in United States<sup>[4]</sup>.

Modified Nigam's inverted curtain Hernioplasty (Modified NICH) is a tension free hernioplasty for inguinal hernias. This procedure is based on the principles of Lichtenstein's tension-free hernioplasty.

This technique is the combination of two hernia operation techniques NICH (Nigam's inverted curtain hernioplasty) and Bassini's repair. Bassini's repair is in partial form only. This technique of hernioplasty for inguinal hernias is simple and has almost no recurrence.

### Material and methods

A total of 50 cases of inguinal hernia were operated by Modified NICH at Max Hospital Gurgaon and other hospitals in Gurgaon between April 2013 to March 2023. The study included uncomplicated primary inguinal hernia, direct or indirect both. The complicated cases of inguinal hernia such as irreducible, obstructed and strangulated hernias were excluded. All patients were operated by same technique. Informed consent was taken from all patients before operation. The patients were admitted in hospital and prepared for operation in usual conventional method. The

operations were performed under local, spinal or general anaesthesia.

Skin incision was made in inguinal region, same in both the direct and indirect inguinal hernia cases. The external oblique aponeurosis was incised in the same line, line of incision, upto superficial inguinal ring. External oblique aponeurosis and internal oblique muscle were separated from each other and a space was made between them by blunt dissection by wrapping index finger with a gauge piece. The space was made on medial, middle and lateral side. Utmost care was taken to avoid injury to ileoinguinal and ileohypogastric nerves and haematoma formation is avoided by being gentle. Rubbing over internal oblique muscle was avoided to avoid haematoma formation and unnecessary bleeding.

Inguinal hernia sac was identified and isolated. The contents of the hernia sac were also identified. Search for femoral hernia was also made. Indirect inguinal hernia sac was cut open and the contents were reduced and the sac was transfixed. Direct inguinal hernia sac was not cut open only reduced and plicated.

In both direct and indirect inguinal hernia the 15 x 15 cm polypropylene mesh was used covering the weak area. It was placed between external oblique aponeurosis and internal oblique muscle in the pocket (the mesh bed) made by blunt dissection and upto inguinal ligament, covering the hernia prone area well.

The inguinal ligament and conjoint tendon (arching fibers of internal oblique muscle) were approximated by 2 prolene 1/0 sutures (partial Bassini's repair) then the mesh was fixed to the inguinal ligament by 2 1/0 prolene sutures one near pubic tubercle and the other approximately 4 cm away from it. The lateral margin of the mesh was cut at a point at 2 cm from the lower margin to make a slit about 4 cm long. The spermatic cord was taken out from the slit and this made an artificial deep inguinal ring of mesh. The two cruras of mesh which made a slit sutured together and then down to the internal oblique muscle fibers at lateral margin of deep inguinal ring including its two cruras. Now a perfect artificial deep inguinal ring is made. This suture serves the purpose: narrowing of deep inguinal ring.

Formation of a new artificial deep inguinal ring of mesh and fixation of mesh to deep inguinal ring prevent recurrence. The newly formed artificial deep inguinal ring of mesh fits snugly around the cord at deep inguinal ring thus preventing any protrusions of preperitoneal tissue and recurrence.

Now the mesh is cut and shaped according to the space available and size of myopectineal orifice of Fruchaud. The extra part of the mesh was excised. The mesh should extend atleast 3 cms beyond deep inguinal ring laterally and 5 cms beyond the lower edge of the arching fibers of internal oblique muscle and 2 cms beyond pubic tubercle. The upper part of mesh is just pushed in the space created between external oblique aponeurosis and internal oblique muscle. The mesh should be placed plainly and without any wrinkles. No suture is applied over the main body of mesh so the mesh looks like an inverted curtain as it is fixed to the rod or inguinal ligament and rest of it remains free like an inverted curtain. That's why the name of the procedure is Nigam's Inverted Curtain Hernioplasty.

The external oblique aponeurosis was closed with 2/0 polypropylene suture, continuous in a semi-double breasting manner. The margin of the upper flap was sutured over the outer surface of lower flap 1 cm below the margin. The free margin of the lower flap remains free under the upper flap. This double breasting can also be done in reverse manner, lower flap stitched over the upper flap in same manner. This

semi double breasting of external oblique aponeurosis gives a slight pressure or support to the mesh influencing it to stick to underlying soft tissues quickly and not to get displaced. The wound was closed in conventional manner. Subcutaneous tissues were closed by 2/0 vicryl interrupted sutures. Skin was closed by staples. Betadine-soaked dressing was applied over the closed wound. Ambulation was not restricted. The patient was discharged next day. Oral antibiotics and pain killers were advised for 3 to 5 days post operatively. All patients were called for follow up on 8<sup>th</sup> post-operative day for removal of sutures and review of the wound.

### Result

Post-operative pain and discomfort was treated with antiinflammatory drug, ibuprofen 400 mg, three times a day. Antiinflammatory drug and sometimes analgesics like paracetamol were required for maximum three days by most of the patients who had pain and discomfort. 48 patients (96%) returned to work from the 4<sup>th</sup> to 12<sup>th</sup> postoperative day as per their work type. This study of 50 cases operated by Modified NICH, did not show any recurrence, however, a larger study is required to support least recurrence. No case required removal of mesh due to infection or neuralgia. One case developed mild neuralgia, which subsided within six weeks. No case developed serious complication.

**Table 1:** Characteristics of patient and hernias

Total	50	% (percentage)
Mean age	44 Years	
Male	46	92
Female	04	08
Right side	35	70
Left side	15	30
Indirect inguinal hernia	34	68
Direct inguinal hernia	16	32
Under Local Anaesthesia	7	14
Under Spinal Anaesthesia	37	74
Under General Anaesthesia	6	12
Recurrence	0	0

(n=50)

### Discussion

Inguinal hernias are the most common abdominal wall hernias. Inguinal hernia is more common in males and on right side. It is due to delayed descent of right testes so delayed closure of processus vaginalis. 65% inguinal hernias are indirect inguinal hernias and 35% are direct inguinal hernias [5].

When the person who is operated by Modified NICH technique stands, walks or runs in day to day life the changed posture or bulge/prominence of abdominal wall will not cause any strain over the mesh as there is no fixation of the main body of the mesh and it is free to take any shape. This factor of Modified NICH reduces post-operative pain and discomfort. It also avoids dead space formation as the mesh curves as per abdominal wall curvature, it avoids collection of blood and haematoma formation as there is no dead space. It is absolutely tension-free procedure.

Inguinal hernia operations are always in discussion and debates due to its postoperative recurrence rate. There are innumerable techniques for inguinal hernia repair operations. The ideal technique is always considered one

which is easy and almost recurrence free or with least recurrence rate. Modified Nigam's Inverted Curtain Hernioplasty (MNICH) is a such technique which has these two important factors. It is easy and with almost no recurrence. The credit goes to the combination of NICH and Bassini's repair as it has the advantages of these two techniques. It reminds us of the words of great surgeon, Nyphus LM, who stated about surgical techniques for hernia repair that, "A single technique is not appropriate for all patients". It is said that Bassini did modernization of hernia surgery about 120 years back and since then only 20 years back we started modernization again [6].

Inguinal hernioplasty is the reconstruction or strengthening of the posterior wall of the inguinal canal by filling the defect or weak area with autogenous or heterogenous material J. Stephenson Scott et al, write (Mastery of Surgery, 2007) that, Tension-free repairs have become the "gold-standard" in hernia surgery.

Modified NICH is a tension free operation, combining NICH, with Bassini's repair (Bassini's repair is done here partially). In Bassini's repair the inguinal ligament and conjoint tendon are approximated with multiple interrupted

sutures but in Modified NICH, we apply only 1 or 2 interrupted sutures loosely depending upon the size of defect. This doesn't put tension. Edoardo Bassini, an Italian Surgeon, known as "the father of modern hernioplasty", developed his procedure of hernia repair in 1885. He did a follow-up of 5 years in all patients, 1885 to 1890 [7]. He reported the recurrence rate of 2.7% at one year [8].

Majority of patients return to normal activity in one week in both open and laparoscopic surgery [9, 10]. In Modified NICH the majority of patients regained normal activity between 4-12 days. Day surgery is safe, efficient, effective and is accompanied by lower incidence of hospital acquired infection and earlier return to normal activity than inpatient surgery. NICH also promotes day care surgery [11].

NICH is a simple procedure developed by the authors. It is an easy, less time-consuming and economical technique giving good results in relation to post-operative pain, discomfort, complications and recurrence. Further studies on this technique should be done to validate the advantages to make it a routine procedure for open repair of primary uncomplicated inguinal hernia.

### Conclusion

Modified NICH is an easy operation for inguinal hernia, both direct and indirect with almost no recurrence. It is a tension-free operation. It involves minimal tissue dissection and minimum sutures. As MICH combines NICH and Bassini's repair (partial) so it also reaps the benefits of both procedures leading to zero recurrence and least complications.

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### Conflicts of interest

There are no conflicts of interest.

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