MODERN MANAGEMENT OF INGUINAL HERNIA

Col PJ VINCENT^{*}, Col Y SINGH^{VSM⁺}

ABSTRACT

Hernia repair is the most commonly performed surgical procedure in male. In the last two decades there have been radical changes in the methods of inguinal hernia repair. This article reviews the various newer options for the repair of inguinal hernia and also discusses the myths and realities about the causes of primary and recurrent inguinal hernia which should bring about a radical change in our surgical practices.

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Introduction

Hernia and its treatment has fascinated surgeons of all latitudes throughout the years of recorded medical history. The operations for hernia have been a paramount indicator of the progress of surgical technique itself. William S Halstead of the Johns Hopkins School of Medicine said in 1892 that "there is, perhaps, no operation which, by the profession at large, would be more appreciated than a perfectly safe cure for rupture".

More than a century later 'a perfectly safe cure for rupture' has eluded the surgeons. Ever since the classical operation of Bassini's repair was devised in 1883 there has been no fundamental progress in hernia surgery till the 1980s. Conventional hernia surgery was based on tissue repairs with the inevitable element of tension in suture line and unacceptable recurrence rates. The advent of prosthetic mesh, the concept of "tension free" repairs and laparoscopic surgery have changed all that. Moreover, long held ideas regarding causes of recurrence, the need for meticulous and tedious dissection and post-operative rest have been dispelled. Hernia surgery has now been demystified and simplified. The learning curve for hernia operations has been shortened dramatically. Undreamt of recurrence rates as low as 0.1% can now be achieved by novice surgeons.

Conventional Hernia Surgery

Repair under tension :

Conventional operations for inguinal hernia are herniotomy, herniorrhaphy and hernioplasty. The most commonly performed herniorrhaphies like Bassini's repair, Shouldice repair, McVay's repair Hal-

stead repair and Nyhus' preperitoneal repair are all based on the concept of closing the Myopectineal orifice of Fruchaud by approximating the conjoint tendon to various ligaments in the floor of the inguinal canal. In the normal individual these structures are not in contact with each other. Any attempt to bring them together like in the above named repairs is bound to create tension in the suture line, however meticulous the technique [1]. This is the fundamental flaw in these operations resulting in unacceptable rates of recurrence.

Meticulous dissection :

Conventional hernia surgery demands meticulous and arduous dissection of all the structures in the inguinal canal, excision of the cremaster, skeletonisation of the cord structures, dissection of the transversalis fascia and the deep ring, plication of the deep ring etc. to various extent [2]. These manoeuvres involve increased operating time and blood loss and higher incidence of post-operative haematomas, seromas, hydroceles and wound infection.

Selective use of prosthetic material :

Because of the fear of the unknown and fear of infection prosthetic material in conventional hernia surgery is restricted to very large hernias and some recurrent hernias. The sea change that has come about in modern management of inguinal hernia is the use of a prosthetic mesh in all groin hernias regardless of type, classification and aetiology [3].

Pre and Post-operative routine

The time-honoured concept of hernia surgery is to eliminate the aetiological factors of hernia before per-

^{*} Associate Professor, ⁺ Professor and Head, Department of Surgery, Armed Forces Medical College, Pune - 411 040

forming hernia repair. This meant doing a prostatectomy before doing hernia repair in case of hernia with benign prostatic hypertrophy. Other relative contraindications to hernia surgery included chronic cough, constipation and obesity. It is now known that these factors do not contribute to either the aetiology of inguinal hernia or its recurrence after surgery [4,5]. Similarly, in cases of bilateral hernia, surgery on one side was done first followed by surgery on the other side 3 to 6 months later to avoid undue tension on the repair if both sides were done simultaneously. In modern hernia surgery simultaneous bilateral repairs are the rule rather than exception [5].

Post-operative bed rest :

In order to prevent tension on the repair and prevent recurrence patient was given strict bed rest in the first few post-operative days and allowed only sedentary activities for various periods from 3 months to one year. This has now been found to be an altogether unnecessary restriction of activities [6].

Modern Hernia Management

The advent of synthetic mesh has made possible the bridging of large gaps in the tissues without tension, making it possible to cure every hernia, regardless of its size or shape. Originally used for the repair of incisional hernias, mesh was subsequently applied with great success to the repair of recurrent inguinal hernias. With the realization that tension is the major cause of recurrence and that, with the use of prosthetic mesh, tension can be absolutely eliminated, Lichtenstien introduced his pioneer concept of "tension free" repair of primary inguinal hernias using synthetic mesh [3]. This method was further improved by Gilbert's "tensionless and suture less" repair [7]. Rutkow advanced these two ideas and combined them to produce his "open mesh hernioplasty" using mesh plug [6]. Among the many advantages of these new methods are standardization, simplicity, minimal dissection and substitution of a strong mesh buttress for the attenuated fascia transversalis, all contributing to a rapid return to normal activities and a minimal recurrence rate well below 1%.

Much that has been written about hernia surgery till recently does not apply to these new techniques. Wide dissection and demonstration of all anatomic structures of the groin, excision of the cremaster and "skeletonizing" the cord, opening the preperitoneal space, using the attenuated and failed fascia transversalis for repair as in Shouldice repair, approximating structures under tension, distortion of anatomy and the suturing of multiple layers of tissues have all been

abandoned. As opposed to what have been the standard methods, less is now beautiful [1]. This explains the rapidity with which the new methods have spread and been popularized.

Modern Classification of Groin Hernias

Modern classification systems are based on anatomical and functional defects established intra-operatively and are designed for choosing the right operation for a particular defect.

i. Gilbert's classification (1988) [7] :

Type 1,2 and 3 are indirect; 4 and 5 are direct.

Type 1 : Hernias with tight (normal) internal ring.

Type 2 : Moderately enlarged internal ring < 4 cm in diameter

Type 3 : Internal ring 4 cm in diameter or larger.

Type 4 : Normal internal ring; diffuse defect in posterior wall of inguinal canal.

Type 5 : Diverticular defect < 2 cm in posterior wall.

ii. Rutkow and Robbins classification (1993) [9].

Same as Gilbert's with addition of types 6 and 7.

Type 6 : Pantaloon hernia.

Type 7 : All femoral hernias.

iii. Other classifications

These are less commonly used. They include Nyhus (1991) [10], Bendavid (1993) [11] and Stoppa (1998) [12].

Modern surgical operations for inguinal hernia are listed below :

1. The Lichtenstein Tension - free Repair [3]

First reported in 1986 this simple operation consists of suturing a patch of polypropylene mesh to the inguinal ligament below, conjoint tendon above and the pubic tubercle and rectus sheath medially. The mesh is split laterally to accommodate the cord; the 'tails' are crossed over and sutured to each other lateral to the cord. A transverse crease incision and not oblique incision is used. Direct sacs are inverted; indirect sacs are dissected upto the neck but are not ligated. They are also simply inverted or excised. Mesh is anchored with a loose continuous suture.

All patients are allowed to eat up to two hours before the operation. Patients walk to the OT where shaving is done. Local anesthesia by local layer infiltration and not regional nerve block is used. Patients walk out from the operation table and go home within two hours after having passed urine. The surgeon

rings up the patient after 24 hours. Patient removes the dressing himself on the 6th post-op day. These details have been mentioned to highlight the extent of simplification and use of patient friendly procedures.

Unlike surgeons who had reserved prosthetic mesh for "difficult" cases Lichtenstein recommends this procedure for all groin hernias. The reported recurrence rate is 0.2 percent in five different centres [13]. In 1995, this idea of non-expert surgeons obtaining excellent results with Lichtenstein's repair was confirmed in a survey of 72 surgeons who performed 16000 operations [14]. Unlike Shouldice repair, Lichtenstein technique does not require a steep learning curve to obtain highly acceptable results.

2. Rutkow's Mesh Plug Repair (1989) [15].

A hand fashioned, umbrella shaped plug of Marlex mesh is inserted into the internal ring after dealing with the indirect sac as in Lichtenstein's repair. For direct hernias the mesh plug is inserted into the preperitoneal space after excising the thinned out transversalis fascia. In both cases reinforcement with a second piece of flat marlex mesh is done. A preformed, ready-to-use umbrella hernia plug (Per Fix) is available. Mesh plug repair is a technically simple surgical procedure, which can be used to repair virtually any groin hernia. This runs counter to the time honoured philosophy of different repair for various types of primary and recurrent hernias. The sine quo non of plug method is decreased dissection and surgeons no longer have to labour under the misconception engendered by 'tension' repairs that every structure in the inguinal canal has to be identified and dissected free.

3. Gilbert's Sutureless Repair [8]

This is similar to Lichtenstein's repair but the mesh is inserted by a sutureless technique.

4. Stoppa's Giant Prosthetic Reinforcement of the Visceral Sac - GPRVS [16]

The essential feature of GPRVS is replacement of the transversalis fascia in the groin and lower abdomen by a large prosthesis that extends far beyond the myopectineal orifice. The prosthesis envelopes the visceral sac, held in place by intra-abdominal pressure (Pascal's Law) and later by connective tissue ingrowth. In theory recurrences after GPRVS are inconceivable; never the less they do occur because of technical errors.

Laparoscopic Hernia Repairs

1. Transabdominal Preperitoneal Repair (TAPP) :

After entering the peritoneal cavity by laparoscopy the preperitoneal space is entered, sac dissected free and reduced. Mesh is used to cover the defect by anchoring it to the Cooper's ligament and conjoint tendon. This is the most commonly performed laparoscopic repair.

2. Intraperitoneal onlay Mesh repair (IPOM) :

This has largely been abandoned because of complications related to possible mesh erosion into bowel.

3. Totally Extra-peritoneal Repair (TEP) :

The mesh is inserted directly into the preperitoneal space. However, a preliminary diagnostic laparoscopy is done.

Scan of current literature shows conflicting reports about the efficacy of TAPP vs TEP [17,18]. Both the procedures are extensively used the world over. The advantages of laparoscopic repair are :-

- Reduced post op pain and disability
- Inguinal and femoral hernias can be inspected bilaterally
- Bilateral hernias can be repaired in one sitting
- An unsuspected contralateral hernia can be detected and repaired in the same sitting.
- It avoids the operative site in recurrent hernias

The disadvantages are :-

- Violation of peritoneal cavity
- Need for general anaesthesia
- Cost

Recurrent Hernia - Myths and Realities

The incidence of recurrence after primary repair of inguinal hernia varies from 1% in specialized centres to 30% in general surveys. Most recurrences appear within two to three years. This "early recurrence" is mainly caused by failure on the part of the surgeon. The smaller "late recurrences" are blamed on tissue failure. In the recent years the cause of recurrence has been studied in detail and new facts have emerged which are contrary to popular teaching.

Tension

The approximation of tissues under tension is cardinal, if not the most important cause of recurrence. Some degree of tension occurs in the most carefully performed operation based on Bassini's principle such as Shouldice repair. Tension is conspicuously absent in mesh repairs.

Infection

50% of recurrent hernias are caused by infection.

Measures to prevent infection include shaving of skin in the operation theatre only just before surgery, continuous irrigation of the wound during the operation with dilute gentamycin solution, covering of tissue flaps with swabs soaked in the same solution, and immersing the mesh in the same solution before use. Use of these measures resulted in zero infection rate in a series of 3000 consecutive cases [19].

The suture material

The process of healing of groin hernia repair takes one year. By the end of six months the repair has gained 80% of its final strength. Any suture material that will not hold the tissue for at least 6 months is thus unsuitable for hernia repair. Biologic material like silk, cotton and linen begin to disintegrate by three months and are likely to increase the rate of recurrence. Monofilament, nonabsorbable synthetic sutures maintain their strength and are practically indestructible in human tissue.

Suture technique

Mass suturing technique has been a great advance in preventing recurrence. Continuous suturing has a greater wound bursting pressure than simple interrupted methods [1]. The Shouldice Hospital has always stressed the importance of continuous suturing and taking large bites of tissue.

Age and body weight

The recurrence rate is actually lower in older age groups contrary to popular belief [5]. Markedly overweight patients are not at an increased risk for recurrence and markedly underweight patients are at a greater risk for recurrence [5].

Chronic cough and prostatic hypertrophy

Chronic cough is not associated with either higher incidence of hernia or higher recurrence [4]. Prostatic hypertrophy is of no significance in the development of hernia or recurrence after repair [4]. Hence there is no rationale in doing prostatic surgery before hernia repair.

The hernial sac

High dissection and not high ligation is important. Surprisingly, ligation of the indirect sac is not only not necessary it may actually cause a local traumatic peritonitis and lead to increased post-operative pain. Indirect sacs may be simply inverted into the peritoneal cavity with or without transection [3]. Peritoneal defects heal within hours or days.

Orchiectomy

This does not influence recurrence rates and the old practice of performing orchiectomy in old patients during hernia repair has no merit whatsoever [1]. Early mobilization after hernia repair and return to normal unrestricted physical activity and hard labour in the immediate post operative period do not cause recurrences. On the contrary, persons with sedentary occupations suffer double the number of recurrences compared to those performing manual labour [6].

Much heated controversy is generated over what is the best operation for repair of inguinal hernia. The answer is probably the method that the surgeon knows well and does best. However, the advent of synthetic mesh has made possible the bridging of large gaps of tissues without tension. Tensionless repairs have led to standardization, simplicity and minimal dissection. Wide dissection 'skeletonizing' of the spermatic cord, opening up of preperitoneal space, using the transversalis fascia, suturing of multiple layers of tissue have all been abandoned. Surgical minimalism is the order of the day. Despite the rearguard action being fought by the traditionalists, these tensionless repairs seem to be the wave of the future.

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