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Preperitoneal inguinal hernioplasty: can be considered as the gold standard procedure for repair of inguinal hernia.

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Abstract:

Inguinal hernia is a challenging surgical problem. There are too many ways of repair of inguinal hernia with different level of potential complications. Some repairs are anatomy-based, some are physiology-based and some are composite or combined repairs. Preperitoneal inguinal hernioplasty is a triumph over all these conventional repairs.

The aim of this research is to judge the outcome of preperitoneal inguinal hernioplasty.

This prospective study was conducted with 330 patients of inguinal hernia in Khulna Medical College Hospital, Bangladesh, from January 2015 to January 2020. Most of the operations were done as day case basis. Convenient purposive sampling was the sampling technique.

Most of the patients (29.7%) in this study were in >60 years of age group. Mean±SD of age was 48±2.1 years. Average operating time was 20-30 minutes. Average blood loss in each surgery was approximately 05-10 ml. Average length of the incision was approximately 3.5-4.5 cm. In this research, in 22.7% (75) cases, the operation was done as a day case procedure. Preperitoneal inguinal hernioplasty was found as the optimal repair with an excellent outcome in terms of surgical site infection rate, average postoperative pain, tenderness, early recovery, patient's compliance, recurrence rate, mesh-related complications, etc.

Preperitoneal inguinal hernioplasty is a superior repair technique than all other existed way of repairing inguinal hernia with the best outcome, therefore, can be considered as the gold standard procedure for inguinal hernia repair.

Keywords: Preperitoneal hernioplasty, inguinal hernia, outcome, recurrence.

Introduction:

Because of their frequency, inguinal hernias remain an important medical problem[1]. The estimated lifetime risk for inguinal hernia is 27% for men and 3% for women[1-3]. Annual morbidity rates in various countries vary from 100 to 300 per 100,000 citizens[4]. In 1890, Eduardo Bassini described suture repair for inguinal hernia.. This was a massive leap forward and has been the basis of open repair for over 100 years[5]. Over 150 modifications to the Bassini operation have been described with little or no benefit except for the Shouldice modification[5]. There were no written surgical guidelines for hernia treatment until 2009 when the European Hernia Society (EHS) published its recommendations based on analysis of the literature and the results of clinical trials. EHS guidelines recommend mesh-based techniques – particularly the Lichtenstein technique – and endoscopic methods for the management of symptomatic primary inguinal hernias in adult men (strength of recommendation IA)1,6.

The choice of method depends on the surgeon; however, the ideal method for modern hernia surgery should be simple, cost-effective, safe, tension-free and permanent. The Lichtenstein operation to a great extent achieves all these goals[7,8]. The Lichtenstein mesh, however, has its shortcomings which include; its initial cost, non-availability in many parts of the developing world, tendency to fold and wrinkle, the movement that may lead to mesh failure, since the groin is a very mobile area and chronic groin sepsis, that requires mesh removal[9]. The predictors of medium-term and long-term outcomes are determined not only by the hernia characteristics, such as the presence of a bulge at the time of operation and the size of the defect, but also the short-term postoperative pain and the length of time taken to resume work or usual duties[10]. Desarda described a new method that appears to meet the above criteria and does not require a prosthetic mesh and does not use weakened muscles or transverse fascia for repair.. It is cost-effective with low rates of complications[11,12]. The most commonly used method in most hospitals is the Modified Bassini[13] because it is easier to learn and cheaper in terms of initial costs[14].

The most commonly used synthetic prostheses in the inguinal region may create new clinical problems such as foreign body sensation in the groin, discomfort and stiffness in the abdominal wall that may affect the daily functioning of the patient15. Surgical site infections, usually with clinical symptoms delayed for years,

are more common after hernia treatment using mesh16,17. Displacement of the mesh from the primary implantation site in the abdominal cavity is one of the most dangerous complications18-20. Intense chronic inflammatory process typically associated with foreign body reactions around the mesh prosthesis may produce meshoma or plugoma tumors, the treatment of which becomes a new surgical challenge[21-23]. Additionally, procreation and sexual function are reported seriously affected after surgical hernia treatment with mesh[19,24]. Thus, we are still far from accomplishing everything in the hernia surgical field, and complications remain the major clinical problem[13]. Considering some certain possible surgical factors, in a RCT (in 2016), a new modification of Desarda's no mesh hernioplasty was done where modification of Desarda's technique is done by adding Modified Bassini's technique (Darn with continuous suturing with non-absorbable polypropylene suture)[1]. The results of this study were promising.

Different physiological repair is now currently on trial. 4 layer suture repair on physiological principle is such physiological repair. But it is so far only applicable in the case of ventral hernia, not yet applicable for inguinal hernia[25]. Dr. John Garvey, who specialises in mesh-free hernia repairs, said the medical profession was too reliant on using mesh to fix hernias and its potentially devastating side effects were being underestimated[26]. In this current study, a new simpler technique of inguinal hernia repair, "preperitoneal inguinal hernioplasty" (with soft polypropylene mesh) is going to be described. The observed results were not only brilliant but also outstanding.

METHODS AND MATERIALS:

This study was conducted as a prospective study with a total number of 330 cases of inguinal hernia, admitted in Dept. of Surgery, Khulna Medical College Hospital, Bangladesh, from a period of January 2015 to January 2020. Most of the operations were done on a day case basis. Study population was selected by convenient purposive sampling based on inclusion and exclusion criteria. The survey data were usually be analyzed using both analytic as well as descriptive statistics. Such as; mean, SD, percentage, etc. Ethical clearance was taken individually from the patient and from the ethical review committee of Khulna Medical College Hospital.

Operational definition: (Preperitoneal inguinal hernioplasty)

All the operations were done under spinal anesthesia. A relatively small cosmetic-friendly skin crease incision (approximately 3.5-4.5 cm) was placed in each patient about 2 to 2.5 cm above the inguinal ligament. External oblique aponeurosis was cut and reflected upwards and downwards by finger dissection (blunt). Inguinal ligament was exposed fully. Separation of the spermatic cord was done. In the case of indirect inguinal hernia, the sac is dissected, open, resected, and ligated at the level of the deep inguinal ring. An approximately 3cm×3cm soft polypropylene mesh was ready to be applied. Lower edge of the mesh was attached to the inguinal ligament by 3-0 polypropylene suture by continuous suturing (can be also done by interrupted fashion). Then the preperitoneal plane was dissected by finger dissection (blunt dissection) up to 4-5 cm in an upward direction. Mesh was then placed with at least 30% laxity at preperitoneal plain. Upper edge of the mesh was fixed with the conjoint tendon with Aberdeen knot (by 3-0 polypropylene suture). Herniorrhaphy was done by suturing the inguinal ligament with the conjoint tendon (by 1-0 polypropylene suture). External oblique aponeurosis was then closed over the isolated spermatic cord. Skin was closed. This is a relatively simple method. Average operating time was 20-30 minutes.

Single-dose of prophylactic 3rd generation of cephalosporin (injection Ceftriaxone) was given at the time of spinal anesthesia. Single-dose of injectable analgesic was given at the time of surgery. After surgery oral analgesics with Diclofenac suppository were given.

Figure I: Incision placement and dissection.

Figure II: Structures- lower edge of external oblique, inguinal ligament, dissected spermatic cord.

Figure III: Fixation of lower edge of mesh with inguinal ligament.

Figure IV: Fixation of lower edge of mesh with inguinal ligament.

Figure V: Dissection of preperitoneal plain.

Figure VI: Preperitoneal dissection up to 4-5cm.

Figure VII: Fixation of upper edge of mesh with the conjoint tendon at preperitoneal plain.

Figure VIII: Placement of mesh with at least 30% laxity.

Figure IX: Placement of polypropylene mesh

Figure X: Herniorrhaphy by suturing inguinal ligament with conjoint tendon (medial portion).

Figure XII: Closure of external oblique aponeurosis

Figure XIII: Skin closure.

RESULTS:

A total of 330 male patients were included as the study population in this clinical research. The age distribution is given in table 1.

Age group (Years)	N	%	Mean±SD
<30	33	10	**48±2.1**
30-39	54	19.4	
40-49	78	23.6	
50-60	67	20.3	
>60	98	29.7	
Total	**330**	**100**	

Table 1: Age distribution of study population.

Major surgical characteristics are depicted in table 2.

Characteristics	n	%
Average operating time	20-30 minutes	----
Average blood loss	05-10 ml	----
Average incision length	3.5-4.5 cm	----
Recurrent hernia	42 patients	12.7
Obstructed hernia	70 patients	21.2
Strangulated hernia	05 patients	1.5
Day case procedure	75 patients	22.7

Table 2: Operative profile.

Total length of hospital staying of the patients is represented in table 3.

Hospital staying	n	%
Within 24 hours	75	22.7
24-48 hours	165	50.0
48-72 hours	70	21.2
>72 hours	20	6.1
Total	**330**	**100**

Table 3: length of hospital staying.

DISCUSSION:

Among the total 330 patients, 29.7% (98) cases were in >60 years of age group, followed by 23.6% (78) cases were in 40-49 years of age group. Mean±SD of age was 48±2.1 years. Average operating time was 20-30 minutes. Average blood loss in each surgery was approximately 05-10 ml. Average length of the incision was approximately 3.5-4.5 cm. Another important observation of research was that this procedure equally gold standard for recurrent, obstructed, and strangulated hernia. The results of this study suggest that 12.7% (42) patients underwent surgery for recurrent hernia with excellent outcome, whereas 21.2% (70) of patients operation was done for an obstructed hernia. Though use of mesh is relatively contraindicated in the case of strangulated hernia, this procedure is also found to be suitable for strangulated hernia, when carefully selected (1.5%, 05 patients). Preperitoneal inguinal hernioplasty can be done as day case procedure where the planned discharge of patients is possible within 24 hours. In this research, in case of 22.7% (75) cases, the operation was done as day case procedure. In 50% (165) patients, discharge from the hospital was possible within 24-48 hours, whereas in 21.2% (70) patients, patients were discharged in between 48-72 hours. Only in 6.1% of cases, discharge was done after 72 hours. Fixation of mesh in the preperitoneal plain was done with 30% laxity, otherwise, the chance of development of chronic wound pain is relatively higher.

In 2016 a newer technique of inguinal hernia repair was described by Faruquzzaman et al., where modification of Desarda's technique was done by adding Modified Bassini's technique (Darn with continuous suturing with non-absorbable polypropylene suture). That particular newer technique was found as very effective with good outcomes in terms of surgical site infection rate, average postoperative pain, tenderness, visual analogue evaluation and return to the normal gait after surgery[1].

In this current study, the results of preperitoneal inguinal hernioplasty were found as excellent. The wound infection rate, other major operative and postoperative complications were nil. As postoperative pain declined very soon after surgery and the length

of hospital staying and recover was so early, the overall patient's compliance was maximum (using the Visual Analogue Scale-VAS). No cases of seroma or meshoma formation, mesh displacement and other mesh-related complication has been observed. Follow-up was done in all patients. Depending upon the timing of surgery, the total length of follow-up was a range between 02 months to 06 years. During this period, no case of recurrence, chronic wound pain or any other major long-term complication has been observed.

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CONCLUSION:
Preperitoneal inguinal hernioplasty is an effective and resilient technique of repair of inguinal hernia in terms of surgical site infection rate, average postoperative pain, tenderness, early recovery, patient's compliance, recurrence rate, mesh-related complications, etc. This technique is a relatively simpler and bloodless procedure without major complications. The result of this study is highly suggestive of that this is a superior technique than all other existed way of repairing inguinal hernia. Hence, preperitoneal inguinal hernioplasty can be considered as the gold standard surgical procedure for inguinal hernia.

CONFLICT OF INTEREST:
The author declares no conflict of interest.

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