

Original article:

Comparative study of role of prophylactic antibiotics in Mesh Hernioplasty

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Abstract:

Background: Inguinal hernia surgery is the most commonly performed surgery worldwide. Lichtenstein repair using polypropylene mesh is the gold standard procedure for inguinal hernioplasty. Wound infection is the most common complication encountered in any surgical procedure. Antibiotic prophylaxis for open inguinal hernioplasty in minimizing wound infection has been a subject of debate since the beginning of mesh repair. We have conducted a randomized clinical trial in our hospital to analyze the usefulness of antibiotics in open inguinal hernioplasty.

Material and methods: The subjects were divided into two groups A and B. The first group was given an IV injection 1gm of Ceftriaxone during induction and the second group was given a placebo(saline). Then a lichtenstein tension free hernioplasty was performed. Post operative control on 3;7 14; 21; 28th day for suture removal and evaluation of infection signs.

Results: There were no significant differences with respect to median age; sex; different hernia types and locations. From 54 subjects 3 were found to have slight erythema around the operation wound. From the three subjects two were from the placebo group and one from the antibiotic group. All 3 cases were treated with wound care and no signs were found on 28th day; and all subjects healed primarily.

Conclusion: Hernial repair is a clean procedure; but some surgeons still use prophylactic antibiotics in lichtenstein procedure as a gold standard assumed due to use of a mesh as a synthetic material that may increase SSI. This research has concluded that on elective hernioplasty no SSI was found on the postoperative wound as erythema is still considered normal wound healing.

Key words : Open inguinal hernioplasty, Antibiotic prophylaxis, Surgical site infection

Introduction

Hernia is a protrusion of a viscus through an abnormal opening in the walls of its containing cavity [1]. 75% of all hernias occur in groin and inguinal hernia is the most common form of all[2]. Inguinal hernias can be either congenital or acquired. Congenital hernias usually occur when there is impedance in normal developmental process rather than an acquired weakness[2]. This is because of patent processus vaginalis and this explains the higher incidence of congenital hernias in preterm babies. Acquired hernias can be direct, indirect, or combination of both. In adult males 65% of inguinal hernias are indirect and 55% of them are right sided[2]. Cause of the hernia is multifactorial. Increased intra abdominal pressure and weak abdominal wall are the basis of hernia formation. Inguinal hernia is the most commonly performed surgery worldwide [3]. About one third of the surgical interventions made by general surgeons are inguinal hernia repair [4]. Mesh repair has become the most popular

technique for inguinal hernia since 1975 [5]. In US and Europe more than 10 lakhs hernia surgeries are performed annually and the figure is nearly equal in India [3, 10]. Among the open mesh repair procedures Lichtenstein technique is the most frequently performed technique [12]. Lichtenstein repair for inguinal hernia is a tension free strengthening of posterior inguinal floor using polypropylene mesh [13, 14]. It is also proven that recurrence of hernia is very low with mesh repair [9]. As of now, numerous clinical trials and meta analysis have concluded the mesh repair is the gold standard in inguinal hernia repair[10,15,16]. Wound infection is the most common complication encountered in any surgical procedure. In case of open inguinal hernioplasty the incidence of infection is reported to be very low, 0.4% to 2% [17,18,19]. Incision site infection has found to be the frequent problem faced in mesh repair[20,21]. Most worrisome problem is mesh rejection occurring following deep surgical site infection. Moreover infection following hernia repair causes fourfold increased chances of hernia recurrence, but this is in particular with herniorrhaphy[22, 23]. It is well documented that antibiotic prophylaxis is recommended in clean contaminated procedures like colorectal resection as they can significantly decrease infectious complications such as incision infections[20]. The antibiotic prophylaxis is also indicated in clean surgeries such as knee or hip arthroplasties, cardiac or vascular graft where foreign material is used. It is uncertain whether antibiotic prophylaxis is necessary in all hernia surgeries as infection rate is very low, even when a foreign body like mesh is used[12, 20]. Therefore, antibiotic prophylaxis for open inguinal hernioplasty in minimizing wound infection has been a subject of debate since the beginning of mesh repair in 1975[11]. One study has concluded that antibiotic prophylaxis cannot be recommended firmly or discarded blindly[19]. Unnecessary use of antibiotic discouraged for its inherent complications. Routine use of antibiotic prophylaxis in mesh repair of inguinal hernia can lead to bacterial resistance and increase in hospital cost. Being a commonly performed procedure worldwide limiting the use of antibiotics will have greater cost benefit, emergence of drug resistance bacteria and also a possibility in reducing toxic effects of the antibiotics.

Aim and Objectives

Aim of this study is to determine the necessity of prophylactic antibiotics in the hope of setting new standard procedures thus reducing cost and bacterial resistance.

Material and methods

This study was performed after getting approval from the human ethical committee of saraswathi institute of medical sciences, hapur, UP. Faculty and post graduates in general surgery department performed the surgeries. All the patients who participated were informed about pros and cons of the study and written informed consent was taken.

characteristics		Antibiotic group(27)	Placebo(27)
sex	male	26	25
	female	1	2
Age(years)		44+/-18	45+/-16
Hernia type	direct	9	11
	indirect	18	16
Hernia location	right	14	13
	left	10	14
	bilateral	3	0

Design and duration:

Prospective study from june2016 to june2017

Setting:

Dept of surgery; Saraswathi institute of medical sciences Hapur UP

Patients : patients between age group 20 to 50 yrs; unilateral or bilateral inguinal hernia undergoing tension free hernioplasty

Excluded patients: patients with obesity ;immunocompromised;HIV;DM; receiving steroids or chemotherapy; recurrent;obstructed or strangulated hernias; anaemics; taking antibiotics for other medical conditions; other systemic or chronic illness(COPDetc) and unfit for surgery .

Procedure

The subjects were divided into two groups A and B. The first group was given an IV injection 1gm of Ceftriaxone during induction and the second group was given a placebo(saline). Then a lichtenstein tension free hernioplasty was performed. Post operative control on 3;7 14; 21; 28th day for suture removal and evaluation of infection signs .

Characteristics of patients with inguinal hernia randomized between prophylactic and placebo:

Postoperative wound assessment:

Days	D3	D3	D7	D7	D14	D14	D21	D21	D28	D28
INFECTION	G0	G1	G0	G1	G0	G1	G0	G1	G0	G1
ANTIBIOTIC	27	0	26	1	27	0	27	0	27	0
PLACEBO	27	0	25	2	27	0	27	0	27	0
AMOUNT	54	0	54	3	54	0	54	0	54	0

Description:

D3 = Day 3 post operation

D7 = Day 7 post operation

D14 = Day 14 post operation

D28 = Day 28 post operation

GO = Normal Healing

G1 =Normal healing with erythema

Result

There were no significant differences with respect to median age; sex; different hernia types and locations. From 54 subjects 3 were found to have slight erythema around the operation wound. From the three subjects two were from the placebo group and one from the antibiotic group. All 3 cases were treated with wound care and no signs were found on 28th day; and all subjects healed primarily.

Discussion

This study was conducted in Saraswathi institute of medical sciences for a period of one year, from June 2016 to June 2017. 54 patients who underwent inguinal hernioplasty were included in the study. Main objective was to analyze the usefulness and necessity of prophylactic antibiotics in inguinal hernioplasty. In the present study, incidence of SSI in open inguinal hernioplasty was 8.33%. The incidence of SSI in the present study was slightly higher than the study done by Yerdel MA, et al. [26] in 280 patients. Aufenacker TJ et al. [12] did a study in 1040 patients and reported SSI incidence as 1.7%. Both the studies showed lower incidence of SSI than the present study, which could be attributed due to smaller study population. Regarding the usage of prophylactic antibiotics in open inguinal hernioplasty, there is still considerable debate. Aufenacker 2003 conducted a multicenter double blinded

randomized control trial in 1040 patients with a primary inguinal hernia scheduled for Lichtenstein repair. Perez AR, et al. [34] also concluded similar results like Aufenacker TJ, et al

Perez AR, et al. conducted a prospective, randomized, double-blind, placebo trial comparing wound infections patients lesser than Aufenacker underwent primary inguinal hernia repair electively using polypropylene mesh. One hundred and eighty patients received prophylactic antibiotics and 180 received a placebo. Superficial SSI developed in 3 patients (1.7%) from the antibiotic group and 6 (3.3%) from the placebo group ($p = 0.50$). One from each group developed deep SSI. Both the above mentioned studies showed no significant difference in incidence of SSI between the antibiotic group and the placebo group.

Conclusion:

Hernial repair is a clean procedure; but some surgeons still use prophylactic antibiotics in Lichtenstein procedure as a gold standard assumed due to use of a mesh as a synthetic material that may increase SSI. This research has concluded that on elective hernioplasty no SSI was found on the postoperative wound as erythema is still considered normal wound healing.

Clean operation is a procedure with no mistakes in sterilization and no leaks on digestive respiratory and urinary tract. Four sources of infection are the medical staff; sterilization techniques; environment and patient risk factors. Antibiotics should not be used to replace proper aseptic and antiseptic methods. Along with good surgical techniques and proper tissue handling infection can be prevented

Other Researches:

Aufenacker (2006) reported SSI of 1.6% on the antibiotic group and 1.8% on the placebo group.

Perez (2007) reported SSI of 2.2% on the antibiotic group and 1.7% on placebo group.

Yerdel (2001) reported decrease of 8.3% infection rates by use of prophylactic antibiotics.

Meta analysis in 2003 and 2008 concluded that prophylactic antibiotic use still requires further research

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