



STUDY ON SINGLE DOSE ANTIBIOTIC PROPHYLAXIS IN LICHTENSTEIN TENSION FREE HERNIA REPAIR

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ABSTRACT

Inguinal hernia repair procedures belong to the group of the most commonly performed procedures in general surgery and are among the first procedures to be performed by junior surgeons during their training period. It is considered as one of the so called 'clean' operations which may not require antibiotic coverage. Many surgeons, however, continue to give antibiotics empirically for all cases. This practice was more widely used after the establishment of the tension free mesh repair technique as the method of choice for hernia repair, because of the fear of infection of the introduced foreign body. We planned to study the efficiency of single dose antibiotic prophylaxis in Lichtenstein tension free hernia repair. We found the advantage of using single dose antibiotic prophylaxis as a part of elective tension free mesh inguinal hernia repair. There was significant difference in duration of hospital stay for patients receiving single dose antibiotic. Therefore, this study recommends the use of single dose antibiotic prophylaxis lichtenstein tension free mesh hernia repair as it can prevent the development of bacterial resistance. Further, it can make the surgery for inguinal hernia much more economical.

KEYWORDS : Inguinal hernia, surgery, Infection, Prophylactic antibiotic, hernia repair

1.INTRODUCTION

According to National treatment guidelines for antimicrobial use 2016, Emergence of antimicrobial resistance in pathogens has become a matter of great public health concern. Antimicrobial resistance is well recognized as a global threat to human health. Infections caused by antimicrobial resistance microorganisms in hospitals are associated with increased morbidity, mortality and health care costs. Resistance has emerged even to newer and more potent antimicrobial agents like carbapenems. Selection and spread of resistant microorganisms in the presence of antimicrobials is facilitated by Irrational use of drugs, Self-medication and Misuse of drugs.

Inguinal hernia repair procedures belong to the group of the most commonly performed procedures in general surgery and are among the first procedures to be performed by junior surgeons during their training period. [1-3] It is considered as one of the so called 'clean' operations which may not require antibiotic coverage. Many surgeons, however, continue to give antibiotics empirically for all cases. This practice was more widely used after the establishment of the tension free mesh repair technique as the method of choice for hernia repair, because of the fear of infection of the introduced foreign body. Over the years, the number of implants used during inguinal hernia repair procedures has considerably increased, and the Lichtenstein method has become the gold standard in the management of this condition [4]

Even though hernia is classified as a clean surgery, the reported incidence of wound infection varies from 0% to 9%. [5] The risk of wound infection increases after introduction of prosthetic material in the body, which is attributed to the detrimental effect of the prosthesis on the host defense mechanism. [6] The fear of infection of the prosthetic mesh raised the question of the potential role of antibiotic prophylaxis. It has been shown that administration of prophylactic antibiotics may inhibit the adherence of bacteria to the prosthesis and subsequently their growth rates. [7] So, surgeons also are inadvertently a cause for inappropriate or over use of antibiotics and thereby development of antibiotic resistance in order to prevent wound infection.

Platt et al, Lazarthes et al found that antibiotic prophylaxis to be of benefit. [8,9] It has also been proved that prophylaxis is better than placebo. [10] The current recommendation for hernia repair is Cefazolin and Clindamycin or Vancomycin may be used as alternative. [11] The current guidelines for elective hernia surgery is to administer Inj. Cefazolin 2gm or Inj. cefuroxime 1.5gm iv stat 1 hr before the surgical incision [12]

Through this study we would like to emphasize that a single dose of antibiotic is sufficient for elective hernia surgeries

2.AIM OF THE STUDY

To study the efficiency of single dose antibiotic prophylaxis in Lichtenstein tension free hernia repair

3.MATERIALS AND METHODS

This is a prospective clinical study of randomly selected patients admitted in the department of surgery, Sivagangai Medial College diagnosed and treated as a case of unilateral inguinal hernia during the study period. The study was performed after the approval from hospital ethical committee.

Inclusion criteria

All cases admitted in the our unit, in department of general surgery diagnosed as a case of inguinal hernia

Exclusion criteria

- Recurrent inguinal hernia
- Immuno compromised patient
- Patients with co morbid conditions like diabetes mellitus, cardiac problems

The patients diagnosed as a case of inguinal hernia underwent detailed history taking, clinical examination, investigations and anesthetic assessment. Povidone iodine was the antiseptic used for skin preparation in all patients. Groin shaving was done the day before surgery. After explaining about the details of the study and procedure to the patient proper informed consent was obtained. One hour before surgery, the patients were administered 2g of Inj. Cefazolin 2gm intravenously after test dose. The patient underwent standard Lichtenstein tension free hernia repair with a 11 × 6 cm polypropylene mesh. Drain was placed depending on the amount of dissection carried out and surgeon's choice. The incision was closed using surgical staplers. A standard sterile dressing was applied post operatively. No post-operative antibiotics were administered. Dressing was removed 48 h after surgery. No further dressings were applied. The patients were discharged next day with the advice of analgesics only. Surgeon who was not involved in surgery followed the case 1 week and 4 weeks, postoperatively. The pre-operative and post-operative details were filled in a proforma and evaluated.

4.RESULTS

Among the 50 patients with one month follow up, Demographic data were comparable between the two groups. The age of the patients in the study ranged from 17 years to 70 years. 47 patients were male and 3 were female. Mean age of the patients was 45 years.

Among the 50 cases operated, 28 cases were direct hernias and 22 cases were indirect hernias All female cases had indirect hernia.

TABLE 1: CASE DISTRIBUTION

		NO OF CASES
SEX DISTRIBUTION	MALE	47
	FEMALE	03
AGE DISTRIBUTION	15 – 30	08
	31 – 45	16
	46 – 60	20
	61 - 75	06
TYPE OF HERNIA	DIRECT	28
	INDIRECT	22
POST-OP INFECTION	SSI	1

Average post-operative stay of the patients was 3 days. Only one patient developed post-operative wound infection, which was treated with antibiotics and re suturing of the wound was performed after 7 days.

5.DISCUSSION

Inguinal hernia repair has been considered as one of the so-called clean operations along with thyroid and breast surgery. The use of tension-free mesh repair techniques has become increasingly popular worldwide and considered as the method of choice for elective inguinal hernia repair. It constitutes approximately one-third of total surgical interventions done world wide

The incidence of surgical site infection following mesh repair for inguinal hernia has been ranging from 0% to 9%[14]. Such a wide range on SSI rates is due to the fact that studies differed in various aspects like difference in study design (retrospective, non-randomized vs. prospective, randomized), surveillance methods (surgical team vs. independent observer), definition of wound infection (no definition vs. CDC definitions), duration of follow-up, type of operation (mesh repair vs. non-mesh repair[15]Overall, the incidence of infection post operatively on an average should be less than 4.5% The idea behind not using the antibiotics is to reduce the cost and to prevent the unnecessary use of antibiotics, thereby reducing the chance of antibiotics resistance. Occurrence of infection in postoperative period does increase the morbidity of the patient, may increase the hospital stay As well as return to work, and may require higher antibiotics. Most problematic scenario is the mesh getting infected, which may even require the removal of mesh.

In our study, the overall infection rate was 2%, in patients undergoing elective mesh repair of primary inguinal hernias. The incidence of wound infection (2%) is much lower in our study when compared to other studies. [15] There is no reliable data regarding the wound infection rates in the hospitals in the developing world and given the fact that few trials even in the developed world have reported 8 to 9% SSI rates[16,17]

There are conflicting reports in literature regarding role of prophylactic antibiotics for mesh hernioplasty. Earlier reports were conclusively in favor of antibiotic prophylaxis[18-21]However, subsequently studies started questioning the practice of routine use of antibiotics[22-23]Recent studies in Indian setting have consistently showed similar incidences of infection in the antibiotics prophylaxis group and control group[24-28]However, in one of the studies the incidence of infection in the control group was quite high.(10.5%).A large number of research papers and reports on the efficacy of antibiotic prophylaxis in hernia repair procedures have been published in the literature , prospective randomised trials (preferably double-blind ones) are of the greatest value some them had post operative infection rate ranging from 0.7% to 7%.

In the recent Cochrane review, which evaluated patients of hernioplasty subgroup, showed that the antibiotic prophylaxis show a significant reduction of wound infection rates. In that review it was concluded as: "In conclusion, the results of this meta-analysis show that antibiotic prophylaxis may be useful to prevent wound infection in open elective hernia repair. However, the data are not sufficiently strong neither to recommend its universal administration nor to recommend against its use when high rates of wound infections are observedRecently published two meta-analysis had shown the beneficial role of prophylactic antibiotics in reducing the infections[28-29]

This study had infection rate which is very much acceptable for a clean operation. Antibiotics easily controlled infection that occurred. Mesh

removal was not required in the cases. In our opinion there is strong case of prophylactic antibiotics in elective mesh hernioplasty in patients with no risk factors. Further large studies and meta-analysis may prove that conclusively.

In our study, there is a positive correlation between the duration of pre-operative hospital stay and the development of post-operative SSI. The post-operative hospital stay was 10 days in the patients with SSI in comparison to 3 days in patients without SSI.

Vast majority of SSI occurring after hernia repair are superficial surgical site infection and are treated by simple drainage with or without antibiotics In our study, the post-operative wound infection was superficial SSI. All the SSIs reported in the studies done by Celdran et al.[17] and Tzovaras et al[30]were superficial SSI. The incidence of mesh infection reported in literature varies from 0.35% to 1%.The incidence of deep SSI was 0% in our study. Aufenacker et al[22]reported an incidence of 0.3% for deep SSI in their study within a follow up period of 3 months. No patient had mesh removal due to SSI in our study.

Cefazolin was the antibiotic used in our study. It was chosen because of its proven efficacy against the common organisms like Staphylococcus aureus, longer duration of action and low costSince the SSI in our study were due to Staph. aureus, the question of failure of prophylaxis due to inefficient antibiotic is ruled out. Cefazolin was the antibiotic used in studies done by Celdran et al., Morales et al., and Perez et alTwo gram of Cefazolin was given intravenously 1 hour before induction of anesthesia. This is consistent with the studies done by other authors. The incidence of wound infection was 9% in the control group and 1% in the antibiotic group in the study done by Yerdel et alThe authors showed a significant difference in wound infection between the antibiotic and control groups. Celdran et al reported SSI rates of 8% and 0% in the control and antibiotic group respectively and had similar conclusions.

6.CONCLUSION

This study was designed to assess the efficacy of single dose antibiotic prophylaxis in lichtenstein tension free mesh inguinal hernia repair in preventing the local infection. An comparable rate of infection was observed in the study group with those receiving post-operative antibiotic cover. Taking it one step further our infection rates were on the lower side of the range of post operative infection rates reported from the developed countries.

As a conclusion, we were able to demonstrate advantage of using single dose antibiotic prophylaxis as a part of elective tension free mesh inguinal hernia repair. There was significant difference in duration of hospital stay for patients receiving single dose antibiotic. Therefore, this study recommends the use of single dose antibiotic prophylaxis lichtenstein tension free mesh hernia repair as it can prevent the development of bacterial resistance. Further, it can make the surgery for inguinal hernia much more economical.

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