A STUDY OF SINGLE DOSE OF ANTIBIOTIC IN INGUINAL HERNIA REPAIR

INTRODUCTION
Hernia repair is one of the most commonly performed general surgical procedures worldwide with an estimated 20 million operations performed annually. Surgical site infection is an important potential complication of any surgical procedure. In most forms of surgery, antibiotic prophylaxis is known to reduce the risk of post-operative wound infection less use of antibiotic in inguinal hernia repair with meshplasty and incidence of surgical site infection. Only single dose antibiotic issue.

MATERIAL AND METHOD: Totally 100 patients admitted for elective inguinal hernia surgery in our hospital with co-morbid conditions were included in this study. One dose of parenteral Cefoxatime 1 gram IV after test dose 30 min prior to surgery and no more antibiotics were prescribed.

RESULTS: In our study out of 100 case only 12 case developed surgical site infection (SSI). In this 10 case of SSI with diabetic malitus and 2 case of SSI in nondiabetic malitus and 8 case of SSI have operation time >1 hours and 4 case of SSI having operation time is 1 hour.

CONCLUSION: Misuse of antibiotics should be avoided as it may lead to increased cost burden on patient and increase the emergence of resistant microorganisms and also increase side effects seen with antibiotics usage. In a resource deficit nation like ours implementation of single dose antibiotic prophylaxis regimes tailored to the prevalent organisms in the institution can result in enormous saving, as the study shows significant reduction in hospital stay with no significant increase in incidence of SSI and as a single dose of antibiotic is used the cost saving can also be enormous.

KEYWORDS
single dose antibiotic, inguinal hernia, surgical site infection

II. MATERIAL&METHODS
This study was conducted as a randomized case-control prospective study in the Department of General Surgery in SMIMER HOSPITAL & MEDICAL COLLEGE, SURAT January 2018 to June 2019. Totally 100 patients admitted for elective inguinal hernia surgery in our hospital with co-morbid conditions were included in this study.

Inclusion criteria
• Patients with the age group 0-60 posted for elective Lichtenstein tension free mesh repair for inguinal hernia were included in the study.

Exclusion criteria
• Patient with co-morbid renal, cardiac, hepatic damages.
• Patient on steroid or having immunedeficiency.
• Non-willing patients.
• Patients on long-term medication for psychiatricproblems

III. OBSERVATIONS AND RESULT
Table 1: Age Incidence

<table>
<thead>
<tr>
<th>AGE (YEARS)</th>
<th>CASES (n=100)</th>
<th>SSI</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 – 10</td>
<td>08</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>11 – 20</td>
<td>08</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>21 – 30</td>
<td>12</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>31 – 40</td>
<td>20</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>41 – 50</td>
<td>16</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>&gt; 51</td>
<td>36</td>
<td>10</td>
<td>27%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>12</td>
<td>12%</td>
</tr>
</tbody>
</table>

SSI - Surgical site infection
Although inguinal hernia can affect any age group, it is most common in the 5” and the 6” decade of life. It is rare in infants and young children below the age of 20 years because of the good muscle strenght . In our study 36% of the cases occurred in the 5” and the6” decade of life. The median age was 24 years In our study, wound infection is mainly seen...
in elderly patients, in 5 decades (27%)

### Table 2: Sex Incidence

<table>
<thead>
<tr>
<th>SEX</th>
<th>CASE (n=100)</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>50</td>
<td>90%</td>
</tr>
<tr>
<td>FEMALE</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Generally, the incidence of inguinal hernia is higher in the male than in the female. This is reflected in our study where 88% of the cases are males. However female cases 12 because of heavy work done by male patient.

### Table 7 Relation To Diabetes

<table>
<thead>
<tr>
<th>STATUS</th>
<th>NO. OF PATIENT</th>
<th>SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIABETIC</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>NON DIABETIC</td>
<td>90</td>
<td>0</td>
</tr>
</tbody>
</table>

In our study, patient which are presented with inguinal hernia with diabetic or non diabetic, in these study SSII. In patients with inguinal hernia patient and 1 case of SSI in non diabetic patient. So diabetic is risk factor for infection.

### Table 8: Duration Of Surgery

<table>
<thead>
<tr>
<th>DURATION IN HOURS</th>
<th>CASE (n=100)</th>
<th>SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 HOURS</td>
<td>08</td>
<td>00</td>
</tr>
<tr>
<td>1 HOURS</td>
<td>68</td>
<td>04</td>
</tr>
<tr>
<td>&gt;1 HOURS</td>
<td>24</td>
<td>08</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>12</td>
</tr>
</tbody>
</table>

In 68 % of the cases the operating times were 1 hours. The minimum duration was <1 hours and the maximum >1 hours. The average duration was 1 hours. With increasing duration of surgery, there is increased risk of infection and hence surgeries with prolonged operating times require antibiotic prophylaxis. In our study the 4 patient who suffered from wound infection had operating times varying 1 hours and 8 patients who suffered from wound infection had operating times >1 hours. This suggests that in those cases in which the operating times are longer, more chances of infection.

### IV. DISCUSSION

In Yogendra D Shah study Surgical site infection rate was 12%. In Soon Min Choi et al Surgical site infection is 13%. In Liberman et al. Surgical site infection is 15%. Same findings are achieved in our study total surgical site infection rate was 12%, which suggest newer technique and less dissection and use of higher antibiotic peri operative reduces chances of post op surgical site infection . (reminder in older study like Soon Min Choi et al study antibiotic used was monoflucar Liberman et al. study antibiotic used was cefoxitin while in Yogendra D shah study and our study used Pippacillin+tazobactam as single shot perop antibiotics).

In a study done by Yogendra D shah study patient group whom single shot preoperative antibiotic was given, have shorter hospital stay, which was around 5 to 7 days while in Soon Min Choi Et Al study patient group whom single shot preoperative antibiotic was given, have shorter hospital stay, which was around 5 to 7 days and in Liberman et al study patient group whom single shot preoperative antibiotic was given, have shorter hospital stay, which was around 7 to 8 days while in our study it was around 7 days, which suggest newer technique and less dissection and use of higher antibiotic peri operative reduces chances of post op surgical site infection and post-op hospital stay.

### Table 3

<table>
<thead>
<tr>
<th>Antibiotic used</th>
<th>Surgical site infection rate</th>
<th>Post op hospital stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefotaxim</td>
<td>Single shot (per-op) 15.6%</td>
<td>5 to 7 days</td>
</tr>
<tr>
<td>Piperacillin+ obactam</td>
<td>Single shot (per-op) -13.8%</td>
<td>5 to 7 days</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>Single shot (per-op) -12%</td>
<td>7 days</td>
</tr>
</tbody>
</table>

BESIDE this one more study done by Seyed-Mohammadreza Sadreri Moosavi Et al.(29)is also compared with our study. In that study age group whom inguinal hernia is common is 50 to 60 while in our study it is >50. They observe that patient came to hospital with P/R examination prostate +1 or normal while in our study it was normal prostate observed . Their study observed that m/c site right while in our study we observed right side. They observed that perop finding direct sac 65%indirect 35%and other study direct 60% and indirect 40%and our study direct 60% nd indirect 40%/. They used cefozitin nd piperacillin tezobactam as single shot per-operative in their study group, while we used only single shot per op cefotaxime antibiotic. They observed surgical site infection rate difference between single shot (15.6%) ,while we found significant result. only in 12%our patient group got post op surgical site infection. Which results also in post op hospital stay. In their study they found average post op hospital stay was 5 to 7 days while in our study it was 7 days, which again proves that newer technique and less dissection and use of higher antibiotic peri operative reduces chances of post op surgical site infection and post-op hospital stay.

### Table 2

<table>
<thead>
<tr>
<th>Age group</th>
<th>Seyed- Mohammadreza Sadreri Moosavi Et al.</th>
<th>Himabindu Et al.</th>
<th>Our study</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 60</td>
<td>60 to 70</td>
<td>&gt;50 years</td>
<td></td>
</tr>
</tbody>
</table>

In our present study, there was no significant difference between the rates of SSIs among the patients with inguinal hernia who received single shot per operative antibiotic shot with other studies whom post operation antibiotics were given. So it emphasize that the addition of postoperative antibiotics with single dose of per operative antibiotics did not reduce the rate of SSIs in patients with inguinal hernia as study done by other author.

In the surgical practice, the supplementary postoperative antibiotics have been used increasingly because of the fear of developing postoperative SSIs. But postoperative antibiotics cannot be the substitute of good surgical and aseptic techniques. The overuse of antibiotics is associated with the increased risk of antibiotic related complications, antibiotic resistant bacteria and cost of care. For these reasons, the benefits and side effects of antibiotics therapy have to be evaluated.

### V. SUMMARY

In this study of 100 cases of elective inguinal hernia surgery performed in SMIMER HOSPITAL & MEDICAL COLLEGE, SURAT in various surgical units using single dose antibiotic. This study included cases of elective inguinal hernia surgery excluding those whose emergency and obstructed inguinal hernia. In a little words according to our study;

1. Most of the patient of our study whom inguinal hernia happened, belongs to >50 year age group (40%) as like Yodendra D. Shah and Liberman et al.study
2. Inguinal hernia episode more occurred in male patient (63.33%) than female one(36.66%) as likeYodendra D. Shah and Liberman et al. Study.
3. As we called most of our patients for elective inguinal hernia, we found most of patients had direct inguinal hernia sac (60%) during operation, which leads to easier repair, and less chances of post-op hospital stay.
operate pain and surgical site infection. In our study we got 12% surgical site infection in such patients.

4. Patient whom we found either direct inguinal hernia with diabetic and age >50, we need extensive dissection which later on results in more post operative pain and more hospital stay time. Also such patients have more surgical site infection rate. Our study found overall surgical site infection rate (12%), which is much lesser than other author study, seyed mohammadreza et al (15.6%), himabindu et al. (13.8%) yogendra et al. (12%) soon min et al (13%) and liberman et al (15%).

5. We found that when intra operative direct inguinal hernia sac, it required less dissection time. Such that our average duration of surgery is just 55 to 60min, much lesser than other authors average 60min.

6. Our post operative patient were discharged as soon as their pain subsides and patients tolerating orally, all because less dissection, newer technology of dissection and preoperative higher antibiotic (cefotaxime) use. Which states in our average post op hospital stay duration which is 4 to 10 day compared to seyed et al 5 to 7days, himabindu et al. 7 to 8days, yogendra et al. 7 to 10days, soon min et al. 7 days, liberman et al 5 to 7days.

VI. CONCLUSION
In this study of 100 cases of inguinal hernia repair with meshplasty performed in SMIMER HOSPITAL & MEDICAL COLLEGE, SURAT in various surgical units using single dose antibiotic. Following conclusions are made:

- Inguinal hernia is most common in the 5th decade offife.
- Inguinal hernia is more common in the male than in the female.
- Most common symptom of inguinal hernia is swelling in right inguinal scrotal, the second most common pain.
- The average operating time is around 1hour.
- When given antibiotic prophylaxis must be given at least 30 minutes before skinincision.
- Incidence of prolonged post operative pain is low; most patients had post-operative pain for one day.
- Reducing the post operative hospital stay help to reduce the chance of wound infection.
- Wound infection is present in 12% of the cases, with none of the patients suffering Grade 3 or 4 wound infections.
- Misuse of antibiotics should be avoided as it may lead to increased cost burden on patient and increase the emergence of resistant microorganisms and also increase side effects seen with antibiotics usage.
- The rate of infusion site thrombophlebitis is reduced, and thus the associated pain and morbidity is also less.
- It also reduces the cost of treatment to patients as well as decreases the economic burden on society.
- In a resource deficient nation like ours implementation of single dose antibiotic prophylaxis regimes tailored to the prevalent organisms in the institution can result in enormous saving, as the study shows significant reduction in hospital stay with no significant increase in incidence of SSI and as a single dose of antibiotic is used the cost saving can also beenormous.

REFERENCES
[12]. Outcome Of Emergency Lichtenstein Hernioplasty, Maecelo A.Beltran, Karina S. Crues; Department Of Surgery, Emergency Unit Hospital DeOvalle.