

## **A Study of Single Dose of Antibiotic in Inguinal Hernia Repair**

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### **Abstract**

**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 is use.*

**MATERIAL AND METHOD:** *Totally 50 patients admitted for elective inguinal hernia surgery in our hospital with co-morbid conditions were included in this study. One dose of parenteral Cifotaxime 1 gram IV after test dose 30 min prior to surgery and no more antibiotics were prescribed.*

**RESULTS:** *In our study out of 50 case only 6 case developed surgical site infection(ssi) . In this 5 case of SSI with diabetic malitus and 1 case of SSI in nondiabetic malitus and 4 case of SSI have operation time >1 hours and 2 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*

**Key Words:** *single dose antibiotic, inguinal hernia, surgical site infection.*

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### **I. Introduction**

Hernia repair is one of the most commonly performed general surgical procedures worldwide with an estimated 20 million operations performed annually. Inguinal hernia repair, either with or without an implanted mesh, is one of the most frequently performed operations in the UK: approximately 71,000 primary and recurrent inguinal hernia repairs were performed in England in 2010–2011 .

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. The relative reduction in risk appears to be consistently around 60 % across many different forms of surgery, ranging from clean to heavily contaminated procedures . The ideal timing for optimal serum drug levels is 30–60 min before surgical incision ,and post-operative administration of antibiotics is now generally considered to be of no benefit in routine practice.

However, there is no clear consensus on whether or not antibiotic prophylaxis is effective in elective inguinal hernia repair. Reviewers at the Cochrane Collaboration concluded in 2012 that evidence derived from 17 randomised controlled trials (RCT) regarding the use of antibiotic prophylaxis in inguinal hernia repair both with and without mesh was inconclusive, neither allowing them to encourage nor discourage its use . A separate meta-analysis, also published in 2012, focussed purely on inguinal hernia repair with mesh and included six of the RCTs identified by the Cochrane review. This analysis concluded that there was a significant benefit associated with prophylaxis. One further RCT has recently been reported: this small study found no significant difference in risk of infection between use of prophylaxis and placebo. Drawing from such conflicting evidence, there is understandable inconsistency between clinical guidelines: in England and Wales, the National Institute of Clinical Excellence (NICE) recommend the use of antibiotic prophylaxis in clean surgery with implanted material but guidelines issued by the Scottish Intercollegiate Guideline Network (SIGN) state that antibiotic prophylaxis is not needed in inguinal hernia repair with or without implanted mesh . The European Hernia Guidelines advise that there is no indication for routine use of antibiotic prophylaxis in elective open or laparoscopic groin hernia repair in low-risk patients but that prophylaxis should be considered for patients with risk factors for wound infection .

In order to examine the feasibility of a future RCT, this study aimed to determine policies, practices and beliefs around the usage of antibiotic prophylaxis in elective inguinal hernia repair with a mesh in adults

and to ascertain whether clinical equipoise exists regarding the effectiveness of this treatment. The objective was to survey surgeons who routinely perform this procedure in the National Health Service (NHS) in London and south-east England. We hypothesised that substantial variation might exist between hospital policies and individual surgeons' practices and that surgeons hold diverse opinions on the efficacy of antibiotic prophylaxis.

## II. Material& Methods

This study was conducted as a randomized case-control prospective study in the Department of General Surgery in M.P.SHAH MEDICAL COLLAGE G.G. HOSPITAL JMNAGAR January 2018 to June 2019. Totally 50 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

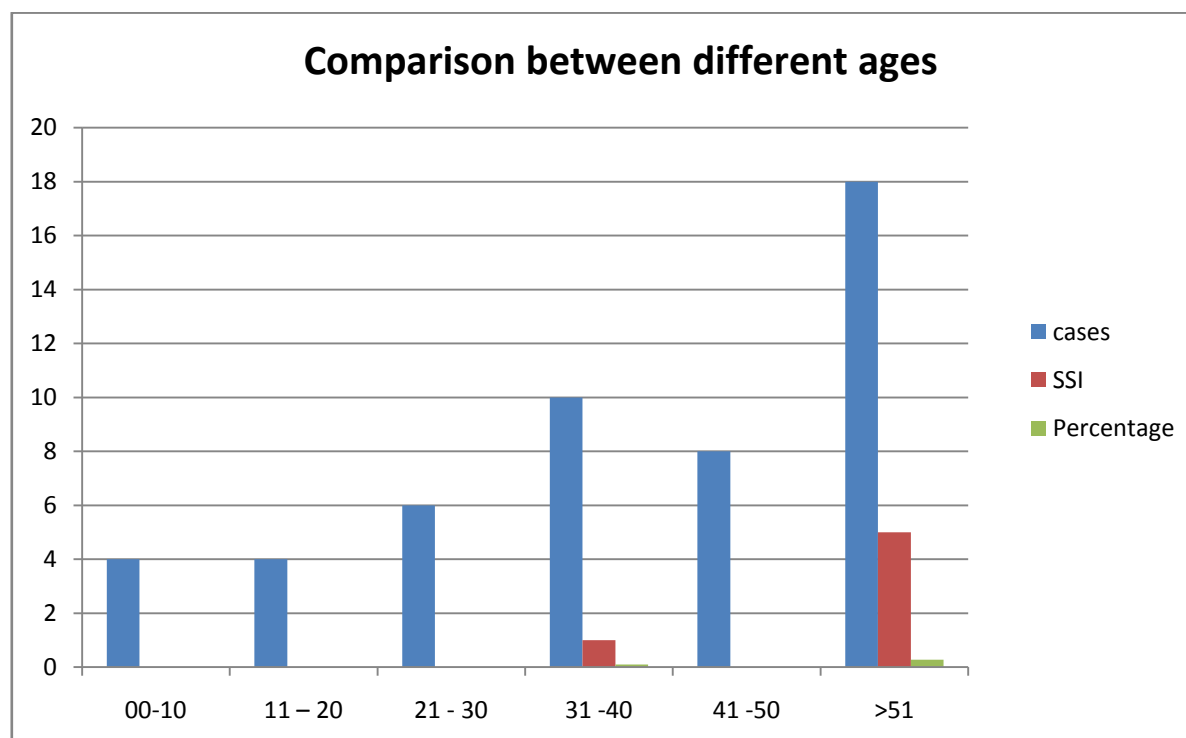
- Patient with co-morbid renal, cardiac, hepatic damages.
- Patient on steroid or having immune deficiency.
- Non-willing patients.
- Patients on long-term medication for psychiatric problems

## III. Observations And Result

TABLE 1: AGE INCIDENCE

AGE (YEARS)	CASES (n=50)	SSI	PERCENTAGE
00 – 10	04	0	0.00%
11 – 20	04	0	0.00%
21 – 30	06	0	0.00%
31 – 40	10	1	10%
41 – 50	08	0	0.00%
> 51	18	5	27%
<b>TOTAL</b>	<b>50</b>	<b>6</b>	<b>12%</b>

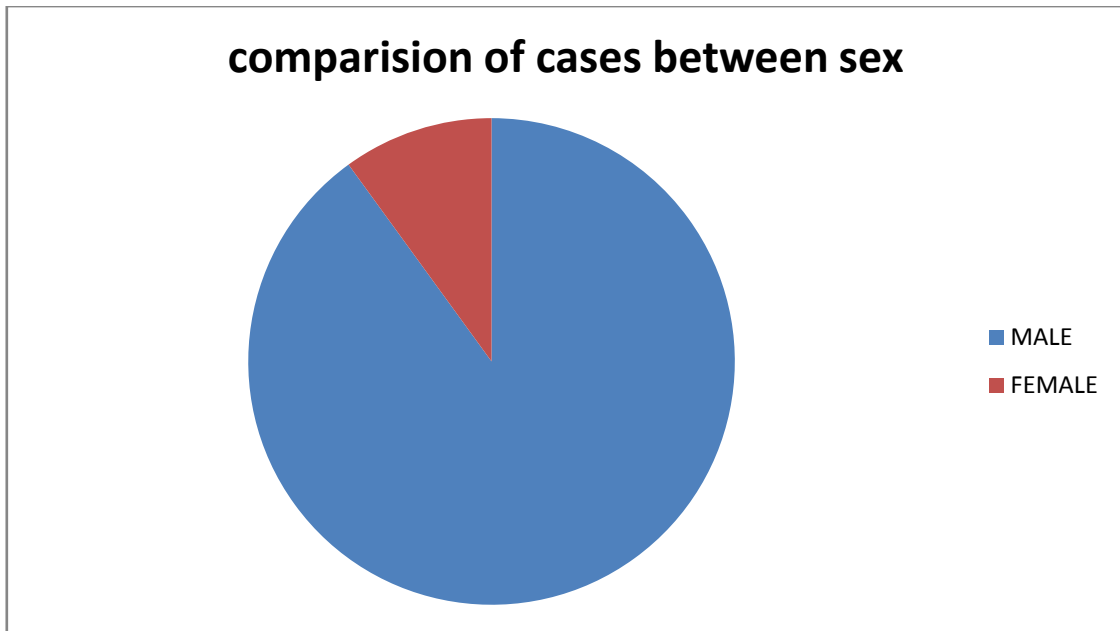
\*SSI - Surgical site infection



Although inguinal hernai can affect any age group, it is most common in the 5<sup>nd</sup> and the 6<sup>rd</sup> 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<sup>nd</sup> and the63<sup>rd</sup> decade of life. The median age was 24 years In our study, wound infection is mainly seen in elderly patients, in 5<sup>rd</sup> decades (27%)

**TABLE 2: SEX INCIDENCE**

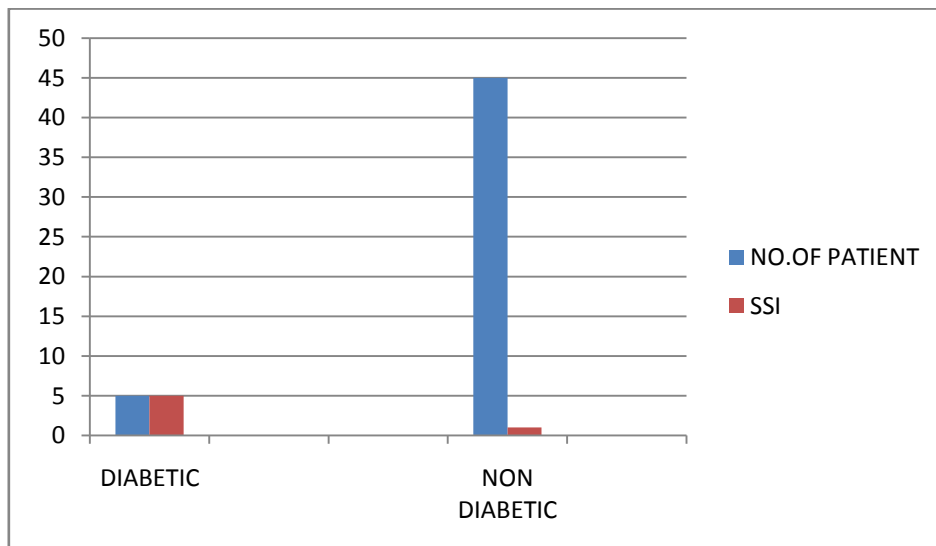
SEX	CASE (n = 50)	PERCENTAGE
MALE	45	90%
FEMALE	05	10%
TOTAL	50	100 %



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 06 because of heavy work done by male patient.

**TABLE: 7 RELATION TO DIABETES**

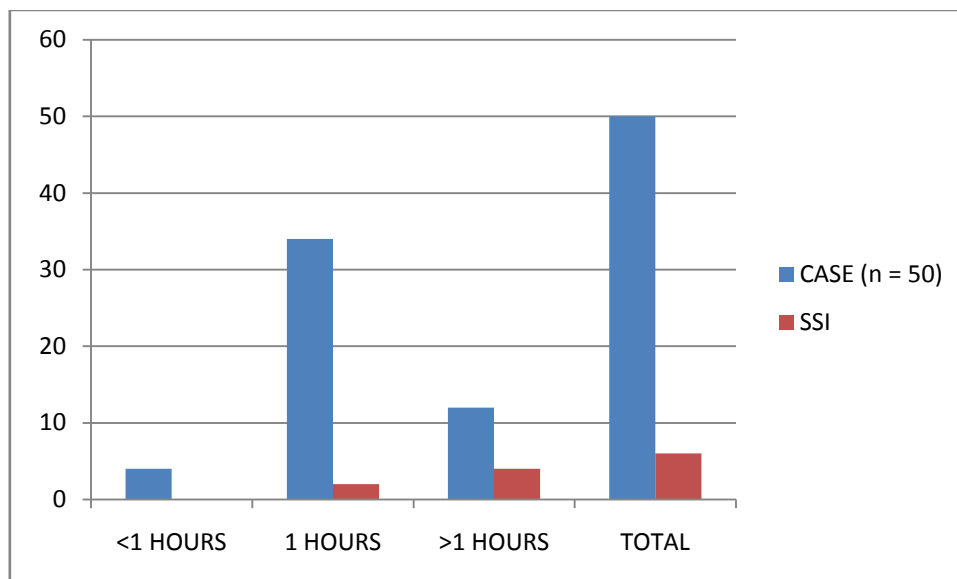
STATUS	NO.OF PATIENT	SSI
DIABETIC	05	05
NON DIABETIC	45	01



In our study, patient which are presented with inguinal hernia with diabetic or non diabetic. in these study SSI 5casesin diabetic patient and 1 case of SSI in non diabetic patient. So diabetic is risk factor for infection.

**TABLE 8: DURATION OF SURGERY**

DURATION IN HOURS	CASE (n = 50)	SSI
<1 HOURS	04	00
1 HOURS	34	02
>1 HOURS	12	04
<b>TOTAL</b>	<b>50</b>	<b>06</b>



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 2 patient who suffered from wound infection had operating times varying 1 hours and 4 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

**TABEL-1**

	Yogendra D. shah et al	Soon Min Choi et al.	Liberman et al.	Our study
<b>Surgical site infection Rate</b>	12%	13%	15%	12%
<b>Antibiotic Used</b>	Piperacillin+Tazobactam	MONOCEF	CEFOTAXIME	CEFOTAXIME
<b>Post op hospital Stay</b>	5 to 7 days	5 to 7 days	7 to 8 days	7 days

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 monocefand Liberman et al. study antibiotic used was cefoxitin while in Yogendra D shah study and our study used Piperacillin+tazobactam as single shot perop antibiotic).

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 its around 7 days, which suggest newer technique and less dissection and use of higher antibiotic peroperative reduces chances of post op surgical site infection and post-op hospital stay.

TABEL-2

	Seyed- Moha mmadreza Sadraei Moosavi Et al.	Himabindu Et Al.	Our study
Age group	50 to 60	60 to 70	>50years
Per rectal	Prostate +1	Prostate normal	Prostate normal
Site	Right	Right	Right
Per op finding	Direct sac 65% Indirect sac 35%	Direct sac 60% Indirect sac 40%	Direct sac 60% Indirect sac 40%
Antibiotic Used	Cefotexime	Piperacillin+tazobactam	Cefotaxime
Surgical site infection Rate	Single shot (per- op) - 15.6%	Single shot (per-op) -13.8%	Single shot (per-op)- 12%
Postop hospital Stay	5 to 7 days	7 days	7 days

Beside this one more study done by Seyed-Mohammadreza Sadraei Moosavi Et al.<sup>(29)</sup> 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 it right site. They observed that perop finding direct sac 65% indirect sac 35% and other study direct 60% and indirect 40% and our study direct 60% and indirect 40%. They used cefoxitin nd piperacillin tezobectum as single shot per- operative in their study group, while we used only single shot perop 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 which that newer technique and less dissection and use of higher antibiotic per operative reduces chances of post op surgical site infection and post-op hospital stay.

TABEL -3

	Seyed- Mohammadreza Sadraei Moosavi Et al.	Himabindu et al.	Our study
Antibiotic used	Cefotaxim	Piperacillin tezobactam	Cefotaxim
Surgical site infection rate	Singleshot (per-op) 15.6%	Single shot (per-op) - 13.8%	Single shot (perop)- 12%
Post op hospital stay	5 to 7days	5 to 7 days	7 days

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 50 cases of elective inguinal hernia surgery performed in Guru Govind Singh Government Hospital 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 like Yodendra 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 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 episode 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 60 min.
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 50 cases of inguinal hernia repair with meshplasty performed in Guru Gobind Singh Government Hospital in various surgical units using single dose antibiotic. Following conclusions are made:

- Inguinal hernia is most common in the 5<sup>th</sup> decade of life.
- 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 1 hour.
- When given antibiotic prophylaxis must be given at least 30 minutes before skin incision.
- 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 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.

## Reference

- [1]. Bailey and Love's: Short Practice of Surgery. 26<sup>th</sup> Edition.
- [2]. Bhattacharya: A Short Case in Surgery, 6<sup>th</sup> Edition.
- [3]. David C. Sabiston: Textbook of Surgery. 1<sup>st</sup> South Asia Edition.
- [4]. Hamilton Bailey's: Demonstration Of Physical Sign in Clinical Surgery – 17<sup>th</sup> Edition.
- [5]. Lloyd M. Nyhus: Hernia, 4<sup>th</sup> Edition.
- [6]. Maingot's Abdominal Operation. 12<sup>th</sup> Edition.
- [7]. Das: A Manual on Clinical Surgery, 6<sup>th</sup> Edition.
- [8]. Schwartz's Textbook of Surgery, 10<sup>th</sup> Edition.
- [9]. Fischer's Master of Surgery, 6<sup>th</sup> Edition.
- [10]. Inguinal Hernia; Ndrzej L. Komorowski, Jorge Moran-Rodriguez, Rehan Kazi, Wojciech M. Wysocki. A.L Komorowski Et Al / International Journal of Surgery 10 (2012) 206-208
- [11]. Tension Free Repair Versus Bassini Technique for Inguinal Hernia: A Control Randomized Study; Magdym.A. Elsebae, Maged Nasr, Mohamad Said: International Journal of Surgery (2008) 302-305
- [12]. Outcome Of Emergency Lichtenstein Hernioplasty, Maecelo A. Beltran, Karina S. Cruces; Department Of Surgery, Emergency Unit Hospital De Ovalle.
- [13]. Clinical Study On Complicated Presentation Of Groin Hernias: International Journal Of Research In Medical Science: Teerthanath Srinivas Et Al. 2017 Aug; 5(8): 3303-3308
- [14]. Grays Anatomy Third Edition by Richard Drake, A. Wayne Vogland Adam Mitchell ISBN 978-0-7020-5131-9
- [15]. A Clinical Study On The Management Of Inguinal Hernia; Manish Baria: International Journal of Scientific Research: Volume 3/Issue: 7/July 2014, ISSN No 2277-8179.
- [16]. Clinical Study on Complicated Presentation of Groin Hernias: Hari Prasad et al. International Journal of Research in Medical Sciences. 2017 AUG; 5(8): 3303-3308.
- [17]. A Study on Groin Hernias Presenting as Acute Surgical Emergencies in Adults: Sanjay Prakash et al; International Surgery Journal/December 2017/Vol 4/Issue 12.
- [18]. Bed Side Clinics in Surgery, Makhantal Saha.
- [19]. Farquharson's: Textbook of Operative Surgery, 9<sup>th</sup> Edition.
- [20]. Incarcerated Groin Hernia In Adults; Presentation And Outcome by J. A. Alvarez, Service Of General Surgery, Hospital San Agustin, Aviles, Spain. November 19. Springer-Verlag 2003.