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Original Research Article

Surgical audit of inguinal hernia surgery under local anaesthesia at a district hospital set up in central India

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ABSTRACT

Background: This article outlines the results of audit for feasibility and reliability of use of local anaesthesia as a routine practice in inguinal hernia surgery in an Indian district hospital setup. Through this prospective study an effort have been made to analyse practicability of local anaesthesia for inguinal hernia surgery in terms of cost effectiveness, minimizing recovery period, and reducing routine case load on hospitals with a goal to provide health for all, in a set up where patient load outnumber resources both in expertise and facilities.
Methods: A prospective analysis and auditing of 120 patients with unilateral inguinal hernia who underwent inguinal hernia surgery by Lichtenstein tension free mesh repair under local anaesthesia at Sehore district hospital during the study period was done. The primary outcomes of the study were analysed on grounds of cost benefit, patient satisfaction levels, complications such as infection, haematoma, chronic pain, and recurrence.
Results: The mean age of patients in present study was 44.23 years (20-76 years). The mean operating time was 70 minutes (40-90). The mean post operative room stay was 3.3 hours (2-6 hours). Intraoperatively 30 patients (25%) had problems such as pain, bradycardia/tachycardia, hypotension, perspiration. Recurrance was observed in 1 patient (0.83%) during the mean follow-up of 3.6 months (1-6 months).
Conclusions: In hernia repairs local anaesthetic is reliable, easy, safe and cost effective technique and its use can dramatically reduce waiting period for operation in planned surgeries.

Keywords: Inguinal hernia, Lichenstein tension free repair, Lidocaine, Bupivacaine

INTRODUCTION

Word hernia is derived from Greek word which means '*a bulge*' and in Latin it means *'to tear*'.[1] A hernia is an abnormal protrusion of a peritoneal-lined sac through the musculo-aponeurotic covering of the abdomen.[2] Since in lower abdominal wall inguinal canal is a potential weak spot as a result approximately 96% of all groin hernias are inguinal other 4% being femoral.[3] Inguinal hernias account for a significant load in out patient department of surgery and since majority are posted as planned procedures, and usual protocol for planned surgeries is in spinal or general anaesthesia which needs bunch of investigations and availability of both anaesthetist and surgical teams to be ready at a point of time; however in developing countries these expertise are always in shortage as compared to patient load. This results in delay of planned surgeries and hence increasing the possibility that same patient may develop complication and may present as emergency case on later date. This increases morbidity, mortality and cost expenses incurred, even reducing the availability of in-patient beds for elective

major operations.[4] Thus a need for developing a patient friendly and cost effective way of performing inguinal hernia surgeries was felt and by using local anaesthesia in inguinal hernia surgeries have opened window of hope for district hospital setup in any limited resource country.

METHODS

This prospective study was conducted at district hospital Sehore, Madhya Pradesh, India from July 2017 to March 2018 in surgical unit. Series of 120 patients with age above 20 years, presenting with uncomplicated unilateral inguinal hernia were included in study. Bilateral hernias, recurrent hernias, femoral hernias, age less than 20 years, patients with active skin infections at operative site, patients with lignocaine or bupivacaine hypersensitivity, patient not willing for local anaesthesia for surgery, complicated hernias like irreducible/incarcerated hernia, obstructed hernia, strangulated hernias and patients with ASA (American Society of Anesthesiology scale) grade 4 and above were not included in the study. Detailed written information was provided to patient about the procedure. We have chosen Lichenstein tension free open onlay mesh repair technique under local anaesthesia preferably by not giving sedation. Surgeries were performed by same surgical team with two experienced operation theatre assistants. The choice of drugs for local anaesthesia were lidocaine, bupivacaine and sedative used, if required were midazolam, diazepam and propafol. One anaesthetist was always there in operation room for any emergency conversion to spinal or general anaesthesia. Local anaesthetic solution used was 50:50 mixture of 1% lidocaine and 0.5% bupivacaine with 1:2,00,000 adrenaline. A skin weal was raised 2.5 cm from the iliac crest along the line joining anterior superior iliac spine to umbilicus. At this point below iliac crest, while passing needle inner surface of ilium is touched by tip of needle. Approximately 10 ml of the solution was injected while slowly withdrawing the needle. Again needle is reinserted at same point at slightly acute angle and about 5 ml solution is injected. Second point of block was 2 cm above the mid inguinal point. The needle was introduced perpendicularly till it pierced the aponeurosis of external oblique. 10 ml of solution was injected at this depth and next 5 ml was injected when needle was withdrawn 2 cm back. Third weal was raised over the pubic tubercle and subperiosteal injection of 3 cc of solution was made. Finally line of incision was infiltrated subcutaneously by approximately 10 ml of solution.[5] After operation patient was kept in recovery room and vitals were monitored and was shifted to ward only after stabilization. Material used for hernioplasty was polypropylene prosthetic mesh with dimensions of 15×7.5 cm. After surgery patient was assessed for pain or discomfort during surgery, post operative pain at the incision site, urinary retention, wound haematoma, sepsis and testicular pain/swelling. Discharge card was provided with detailed instructions related to dressings, suture removal and follow up timings. Follow up of the patients were carried out postoperatively as outpatient initially at post operative day 5, 10, after 6 weeks then routinely at monthly interval. In follow up patients were assessed for any wound sepsis, persistent pain at incisional site, recurrence and any other complication. After 6 weeks of surgery patient was provided with a surgical self satisfactory assessment form in which they were asked to rate their satisfaction level by giving score 0-10 and quality of life along with patient satisfaction was assessed by responses to a health questionnaire administered. Pain was assessed by visual analogue scale. We used scoring system by Saber et al for pain assessment. [6]

This system is a 3-scale system; with maximum score as 7 points and minimum as 2 points.

- Analog scale pain score (1-10): mild (1-4) = 1 point, moderate (5-7) = 2 points, severe (8-10) = 3 points.
- Prosthesis awareness: Yes = 1 point, no = 0 point.
- Physical activity: Pain only on exertion = 1, pain limits some daily activity = 2, disabling pain=3

Finally a surgical audit was performed assessing the results. Statistical analysis was performed using SPSS statistical software, version 16.0 (SPSS Inc., Chicago, IL). Student- t tests for parametric continuous variables and chi-square analysis for categorical variables were used. P value of less than 0.05 was considered statistically significant.

RESULTS

Age group of patients (n=120) observed in this series ranged from 20-76 years. Youngest patient was of 21 years and oldest was 76 years with mean age of 44.23 years. All patients operated were males. Incidence of indirect inguinal hernia was 58.33% (n=70) and direct inguinal hernia was 41.67% (n=50). Mean age of presentation of indirect inguinal hernia was 39.4 years and direct hernia was 58.6 years. In our study 68.33% (n=82) patients have hernia on right side and 31.67% (n=38) have hernia on left side**.** The time taken for surgery was calculated from the time of anaesthesia till dressing. The mean operating time using Lichtenstein technique in adult unilateral uncomplicated inguinal hernias was 70 minutes (40-90 minutes) with mean time for direct hernia repair was 52.36 minutes and indirect hernia was 76.22 minutes. The mean post operative recovery room stay was 2.3 hours (2-6 hours). Mean postoperative hospital stay was 3.36 days (3-5 days). Average time taken by patients to resume normal daily routine activities was 2.34 days (2-5 days). Mean time for ambulation after surgery was 46 min (15-160 minutes). Mean pain score at post operative day one (24 hours after surgery) was 2.6 and on follow up after 6 weeks was 2.1. Mean score for satisfaction after surgery on 6th week follow up day was 8.34.

Table 1: Age group wise distribution of variety of hernia.

S.no	Age group (years)	Total number (%)	Direct sac (%)	Indirect sac (%)
1	20-29	20 (16.67)	0 (0)	20 (16.67)
2	30-39	30 (25)	0 (0)	30 (25)
3	40-49	23 (19.17)	8 (6.67)	15 (12.5)
4	50-59	33 (27.50)	28 (23.33)	5 (4.17)
5	60-69	12 (10)	12 (10)	0 (0)
6	≥70	2 (1.67)	2 (1.67)	0 (0)

Table 2: Time taken for surgery

Time in minutes	Number of cases	Percentage (%)
40-49	11	9.17
50-59	48	40
60-69	54	45
70 -79	6	5
80 and above	1	0.83

Table 3: Trends in post-operative pain scores.

Time interval in hours	Mean score	Standard deviation
12	2.6	1.39
24	3.7	0.31
1008 (6 weeks)	2.1	0.03

Table 4: Complications during procedure.

Complications	N	%	Age group (years)
Arrhythmias	2	1.67	60-69
Anaphylaxis	0	0	-
Pain needing sedation	5	4.17	40-49
Hypotension	1	0.83	50-59
Bowel injury	0	0	-
Bradycardia	1	0.83	50-59
Tachycardia	21	17.5	20-76

Table 5: Incidence of post-operative complications.

S. no	Complications	No. (%)	Age group (years)
1	Wound Haematoma	3 (2.5)	50-76
2	Wound infection	15 (12.5)	50-76
3	Testicular pain/swelling	3 (2.5)	40-49
4	Urinary retention	20 (16.67)	30-76
5	Headache	0 (0)	0
6	Postural hypotension	0 (0)	0
7	Recurrence	1 (0.83)	60-69
8	Chronic pain	16 (13.33)	40-69
9	Seroma	20 (16.67)	40-69
10	Nausea and vomiting	0	0

Table 6: Time to resume routine activities.

S. No.	Days	N
1	≤2	106
2	2- 3	10
3	3-4	4
4	>4	0

Table 7: Patient questionnaire.

Patient questionnaire	Yes	No
	N (%)	N (%)
Was the information given before the operation adequate?	117 (97.5)	3 (2.5)
Were you happy with the overall care received?	119 (99.17)	1 (0.83)
Would you recommend a hernia operation under local anaesthesia to your friends	120 (100)	0
	Score	**Number of patients**
Please indicate your overall satisfaction with the service provided (score 1–10)	10	101 (84.17)
	9	10 (8.33)
	8	8 (6.67)
	7 or below	1 (0.83)

DISCUSSION

Our audit for inguinal hernia repair under local anaesthesia was given a respectable satisfactory score by majority of patients under study. Post-operative care givers were able to spend more time with patients counselling them as their work load was reduced dramatically because most of patients were shifted to oral medications and fluids immediately after shifting to ward. More focus could be made towards emergency patient load. Anaphylaxis is known complication of local anaesthesia. Study done by Davis et al reported anaphylaxis rate of about 1% to local anaesthesia.[7] In our study no patient suffered from this complication. Intra-operatively 115 (95.83%) of our patients reported no pain and 5 (4.17%) patients who complained of pain intra-operatively were managed by sedation with propofol. Our results are comparable to Baskerville et al in their study of 129 patients operated under LA, 93% patients felt no pain during surgery and 7% reported pain during surgery.[8] Pain was mostly reported in large chronic hernias where separation of sac was difficult due to adhesions. One patient in our study had bradycardia, which may develop due to stretching of the peritoneum while dissecting the sac. Releasing the tension on the sac and additional infiltration at the inguinal ring resolved the problem.[9] Local anaesthesia reduces post operative pain because of local analgesic effect at site of surgery.[10] Fifteen (12.5%) patients had subcutaneous wound

infection. Few stitches were opened and the wound healed by second intention. Wound hematoma was seen in 3 (2.5%) patients, possibly our incidence of wound haematoma was less as we have used tight compression dressing at surgical site. Seroma developed in 20 (16.67%) patients which were aspirated with the help of 14 gauze needle. Three (2.5%) patients developed testicular swelling post operatively which was managed conservatively with scrotal support. Postoperative pain relief with oral analgesics was adequate in 110 (91.67%) of our patients while only 10 patients required injectable analgesics. Our results related to post operative analgesic required are in accordance with interpretations drawn by Young et al.[11] None of our patient complained of post operative nausea and vomiting, which is often associated with spinal anaesthesia.[12,13] Post operative urinary retention was developed in 20 patients out of which eighteen resolved with hot fomentation and only two required catheterization. The patient can be mobilized early therefore they can resume normal activity very early.[14] It is economical because of low cost of local anaesthetic medication, which is not more than Rs. 150/- INR per patient in this study, which is in accordance to other similar studies.[15,16] A common complaint by patients receiving local anaesthetic infiltration is pain of infiltration this can be reduced by adding sodium bicarbonate to buffer local anaesthetic solution which reduces pain and thus the satisfaction level of surgery.[17] Under local anaesthesia patient can be asked to cough allowing surgeon to examine the defect intra-operatively and the strength of the repair can also be checked, thus minimizing chance of recurrence. In respect to early and late complications our results are comparable to most randomized or non randomized studies.[18-22] Results obtained in terms of intra and post operative complications and recurrence rates were similar that achieved by tertiary care centres.[23]

CONCLUSION

Audit of inguinal hernia surgeries under local anaesthesia in a district hospital set up revealed that inguinal hernia repair under local anaesthesia is economical, safe, feasible, and effective in patients who are either unfit for general and spinal anaesthesia. We recommended that frequent workshops on this technique should be organized to train surgeons working in community health centres and district hospitals. A comprehensive and well presented preoperative counselling along with an effective training of operating theatre staff would help in promoting practice of local anaesthesia particularly in inguinal hernia surgeries in developing countries.

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