ORIGINAL ARTICLE

Tolerability and Outcome of Inguinal Hernia Repair under Local Anesthesia among elderly male patients high risk for General or Regional Anesthesia

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ABSTRACT

Background: Surgical repair of inguinal hernias in elderly population is challenging as these pts may have associated co-morbid conditions which make them high risk for general or regional anesthesia.
Aim: To find out tolerability and outcome of operating inguinal hernia among elderly population who are high risk for general or regional anesthesia.
Methods: One hundred elderly patients with inguinal hernia who were high risk for general or regional anesthesia were included in the study from January 2014 to January 2016. Associated co-morbid conditions were labeled. All the patients received treatment with prosthetic mesh repair under local anesthesia. The patients were evaluated for tolerability and outcome of local anesthesia.
Results: The mean age was 78.2±9.64 years. Following were co-morbid conditions: hypertension in 56(56%) patients, ischemic heart disease in 44(44%) patients, diabetes mellitus in 22(22%) patients and chronic obstructive pulmonary disease in 17(17%) patients. Local anesthesia was tolerable in 95(95%) patients. Pain during procedure was seen in 3(3%) patients, while nausea/vomiting and headache in 1(1%) patient each. Postoperatively, pain was seen among 4(4%) patients, urinary retention in 1(1%), inguinodynia in 1(1%) patient, and scrotal hematoma in 2(2%) patients.
Conclusion: Our experience shows that prosthetic repair for inguinal hernia among elderly patients who are high risk for general or spinal anesthesia is well tolerated and has favorable outcome. In future it may erase the wait and watch strategy in such patients.
Key words: Inguinal hernia; high risk patients; tolerability; local anesthesia

INTRODUCTION

Inguinal hernia is a common pathology seen during surgical practice. It is a more frequent practice among elderly patients as compared to younger population. Difference between the two age groups is: 11/10,000 person-years in age group of 16-24 years while 200/10,000 person-years in age group ≥ 75 years[1]. Males are affected more as compared to female with a ratio of 20:1[2]. Prosthetic repair of inguinal hernia is a frequently performed procedure all over the world (approximately 730000 surgeries for repair for inguinal hernia are performed every year in United States[3]. Utilizing the conception of tension free prosthetic mesh repair, the surgery for inguinal repair have evolved many techniques like Lichtenstein's repair and also more recently laparoscopic total extra-peritoneal (TEP) repair for hernia[4,5,6,7].

Usually, the only presentation of inguinal hernia is swelling, sometimes it may generate aching and discomfort, but it has been noticed that it hampers the quality of life in geriatric population which may be improved with hernioplasty[8]. Moreover, if inguinal hernia are left without treatment, they put the patients on increased risk of complications like bowel obstruction and/ or strangulation which may be threatening to life[9,10]. Moreover, the load of services required to manage the problem in elderly patients is higher than adult population due to presence of co-morbid conditions[11].

Among the various available anesthesia options, general or regional anesthesia are widely used for repair of inguinal hernia. Safety of the patients and optimization of operating condition is the preference of surgeons while selecting the anesthesia for the patients[12]. Since the geriatric patients may be associated with co-morbid conditions like cardiovascular disease, chronic obstructive pulmonary disease, or diabetes mellitus etc, which make them high risk for general or regional anesthesia for any surgical procedure due to alteration in hemodynamic status, respiratory and central nervous system compromise during general or regional anesthesia[13]. For such patients, some authors have even suggested watchful waiting, but a safest option available for these patients is utilization of local anesthesia, which may prevent all the hazards of general or regional anesthesia[14]. Local anesthesia aided with intravenous sedation used during the surgery may lessen the impact on

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functioning of vital organs like heart, lungs, or central nervous system. Moreover, it may reduce the hospital stay and may help in early recovery of the patients[15,16].

Although it has shown benefits in some studies, the use of local anesthesia for hernia repair is being used but is not widely accepted in Pakistan. Previous studies have focused on outcome, but tolerability has not been discussed in many studies. Moreover, the studies addressing the outcome in high risks elderly population are scanty. Therefore, we herein evaluated the tolerability and outcome of utilizing local anesthesia among elderly population for inguinal hernia repair who were at high risk for general or spinal anesthesia.

MATERIALS AND METHODS

In this prospective study, we enrolled 100 consecutive high risk elderly (age $\geq$ 65 years) male patients who were admitted for repair of inguinal hernia from January 2014 to January 2016 through outpatients department of two tertiary care units of Sharif Medical City Hospital Lahore and Rasheed Hospital Lahore. The inclusion criteria was presence of reducible inguinal hernia (the swelling disappears in lying down and positive cough impulse) and no signs of bowel obstruction or strangulation (vomiting, pain, tender irreducible swelling). The criteria for labeling high risk was; presence of co-morbid conditions like ischemic heart disease, previous cardiac surgery or stenting, COPD, DM, HTN, arrhythmias, liver cirrhosis, obesity, chronic kidney disease, and deranged clotting profile. The patients who had recurrent or bilateral disease or unwilling for local anesthesia were excluded from the study. Detailed history and thorough physical examination was done. Routine laboratory investigations were done in every case. X-ray chest and electrocardiogram (ECG) was also done in every patient. High risk consent was taken in every. All the patients received prosthetic mesh repair for inguinal hernia under local anaesthesia. Anaesthetic solution used was 50:50 mixture of 1% xylocaine and 0.5% bupivacaine with 1:2,00,000 epinephrine. Approximately 2.5 cm from iliac rest, a skin weal was elevated along the line joining anterior superior iliac spine to umbilicus. The needle was then approximated through this point to hit inner side of iliac bone below iliac crest. Approximately, 10 ml solution was injected as the needle was withdrawn slowly. A repeat injection was given after the reinsertion of needle at a slightly steeper angle and 5 ml of solution injected. For 2nd point of the block, a point 2cm above the mid inguinal point was selected. Through this point, needle was inserted in a perpendicular fashion, until it pierced the aponeurosis of external oblique. A ten ml of solution was injected at this depth and 5 ml as needle was withdrawn over 2cm. Then another weal was raised over the pubic tubercle and subperiosteal injection of 3 cc of solution was given. Later, the completion of block was achieved by injection 10 ml solution in the subcutaneous plane along the line of surgical incision. All the patients received tension free Lichenstein hernioplasty. Suprapubic incision was given, subcutaneous tissue was incisied, external oblique apenourosis was cut to open superficial inguinal ring. The hernia sac identified and separated from contents of spermatic cord. Plication of fascia transversalis done and repair was completed with polypropylene mesh of size 6x11 cm in all cases. For indirect hernia, herniotmy was also performed. Layer by layer closure was done while restoring the anatomy. During surgery, the patients were assessed for tolerability: development of arrhythmia (abnomrmal ECG on cardiac monitor), bradycardia (heart rate < 45 beats/min), nausea or vomiting, pain during the procedure (measured on VAS, a score of $\geq$ 1 was taken as pain), need for additional anesthesia (general or spinal) during surgery, requisition of any cardioplulmonary resuscitation or headache. Tolerability was labeled as 'yes' if none of the above was present. Patients were discharged on the same day or in the next day if no complications of the procedure (hematoma, pain or urinary retention) occur. The patients were followed up on outdoor basis over a period of three months for the following complications, like wound site hematoma or seroma, scrotal hematoma or seroma, wound infection or mesh infection, and/ or pain. All the data was entered through SPSS version 20 and analyzed through it.

RESULTS

The mean age was 78.2±9.64 years (range 65–93 years). All the patients in study were males. Direct hernia was present in all (100%) patients, while 16(16%) patients also had indirect hernia. Right sided hernias were present in 67(67%) patients, while left sided hernias were present in 37(37%) patients. There were 71(71%) patients who had incomplete inguinal hernia, while 29(29%) patients had complete inguinal hernia. The frequency and percentage of the associated co-morbid condition is given in table 1.

Table 1: Associated co-morbid conditions among the patients

Co-morbid conditions	n	%age
Obesity	5	5
Hypertension	56	56
Diabetes mellitus	22	22
Arrythmias	3	3
Ischemic heart disease	44	44
Chronic obstructive pulmonary disease	17	17
Chronic liver disease	9	9
Renal failure	12	12
Deranged clotting or bleeding profile	6	6

The procedure was tolerable among 95(95%) patients. The parameter of tolerability is described in table 2. The intraoperative and postoperative complications are described in table 3. The procedure was successfully completed in all patients. The mean operative time was 46.35±7.82 minutes. No intra operative or postoperative mortality was observed. The mean hospital stay of the patients was 1.02±0.57 days.

Table 2: Tolerability of the procedure

Parameters	n	%age
Arrythmias	0	0
Bradycardia	0	0
Pain during the procedure	3	3
Need for another anesthesia (general or local)	0	0
Requisition of cardiac or pulmonary resuscitation during surgery	0	0
Nausea or vomiting	1	1
Headache	1	1

Table 3: Outcome of the procedure

Pathologies traced	n	%age
Wound hematoma/ seroma	1	1
Wound infection	0	0
Scrotal hematoma/ swelling	2	2
Urinary retention	1	1
Postoperative pain (VAS >1)	4	4
Mesh infection	0	0
Inguinodynia	1	1

DISCUSSION

Repair of inguinal hernia is preferably done under general or regional anesthesias among as both offer optimal operating circumstances to the surgeon in term of adequate muscle relaxation and immobility of the patients. The other advantage is better intraoperative or postoperative control of pain. But with increasing age, the patients may acquire variety of co-morbid conditions which make them high risk for general or regional anesthesia. In this scenario, local anesthesia can be a safe option for such patients[17,18]..However, the trend of adopting local anesthesia as option for surgery is not very popular among surgeons. The utility of local anaesthesia in repair of inguinal hernia fluctuates from only 3% in Sweden, 18 % in Denmark and almost 100% in Shouldice clinic, Toronto clinic and some other dedicated hernia center[19]. Even in Pakistan, the use of local anesthesia for inguinal hernia repair has not fully established. Only a few centers had reported practicing this and no isolated study had been done in elderly population with co-morbid condition.

We selected a study population of >65 years, because the studies have shown that frequency of inguinal herniats and associated co-morbid condition is higher in this age group. Even the morbidity in elder population is almost three times higher than in younger age group[17]. In our study, the mean age of the patients was 78.2±9.64 years ranging from 65–93 years which is higher than any study internationally. In a study by Gravelo A, et al[20], the mean age of the patients was 74 years.

We found that most common co-morbid condition was hypertension (56%) followed by ischemic heart disease (44%). COPD was also seen among 17% patients and diabetes was also another problem which was found in 22(22%) patients. Amato B, et al, also highlighted that these problem were also common in their study population like 25% patients suffered from hypertension, 50% suffered from coronary disease, diabetes 10%, and COPD in 12.5% patients. These were the conditions which make the patients more suitable for repair under local anesthesia. The frequency of these co-morbid conditions may vary in different geographical area. Regarding the cardiovascular disease in elder population, this has been observed in a previous study by Frazzetta M, et al[21], that the prosthetic hernioplasty carries the similar advantage (quicker recuperation) as in elderly non cardiac risk patients. Moreover, there was difference in early or late complication among patients with cardiac risk factor or without it.

The most important factor in success of the procedure was the tolerability. Tolerability of the procedure was based over the happening of worse intraoperative events related to general or spinal anesthesia. We observed that application of local anesthesia avoided most of the intra operative complications that could have occurred during spinal or general ansthesia. Only 3% patients suffered from pain, which was managed with IV sedation with midazolam (5mg administered intravenously), nausea/ vomiting in 1% each which were managed with central antiemetic agents (ondasetron 8mg intravenously stat). Headache was observed in only 1% patients which was managed with intravenous infusion of paracetamol 500mg given in stat dose.

Pain during surgery is the most important concern of the patients. We observed a very low incidence of pain during surgery. Baskerville PA et al[22] conducted a study among 129 patients undergoing repair of inguinal hernia under local anesthesia and observed that 93% patients did not suffer any pain. Earle AS, et al[23], observed that pain was observed in 50% patients in their study. They also observed pain occurred during manipulation of larger sacs, with adhesions. However, we did not include incarcerated hernia.

In our study, 91% patients recovered uneventfully in the postoperative period. The most common problem was postoperative pain which was observed in 4% patients, followed by scrotal hematoma developed in 2% patients. Shaikh et al[24] observed successful recovery in 90.7% of the

patients. In their study, 5% had wound infection, while Amid et al. observed wound sepsis in 2% patients. Gianetta et al[25], observed development of scrotal hematoma in 2.7% patients, and wound sepsis in 0.7% patients. In a study by Chowlek et al[26] wound infection and scrotal edema was observed in 3.5% patients and urinary retention was observed in 1.75% patients.

In our study, we observed inguinodynia in 1% patient, while Erhan et al[27], mentioned igunioynia in 4-6%, and Phoolbalan et al[28], reported inguidoynia in 10% cases after prothetic repair of inguinal hernia. Our low rate of inguinodynia may be explained with identification of Ilioinguinal nerve or Iliohypogastric nerve during open dissection. It may also be due to the reason that all the surgeries were done by an experienced consultant surgeons.

In our study, we did not observe any mortality. None of the study which had done this procedure under local anesthesia had documented mortality in any case. Chen T, et al[29] mentioned a mortality rate of 1.7% among patients receiving hernia repair under general anesthesia.

CONCLUSION

It is concluded that the practice of inguinal hernia repair under local anesthesia for elderly patients who are at high risk for regional or general anesthesia is well tolerated by the patients and shows promising outcome. In these elderly patients considering the co-morbid conditions and high intraoperative risk, local anesthesia may be a good alternative choice against general or regional anesthesia.

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