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Original Research Article

Clinical study of pain after inguinal hernia repair

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ABSTRACT

Background: Chronic severe pain following inguinal hernia repair is a significant post-operative problem. Pain is a complex study subject, mostly defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
Methods: Patients undergoing elective inguinal hernioplasty in the Hospital from March 2016 to March 2017 were included in the study. Seventy-eight patients were present for follow up for a period of 6 months. Patients presenting with obstructed/strangulated inguinal hernia were excluded from study.
Results: Majority of our patients were male 97.43% with mean age 49.1 years (range 16-78 years). Table 8 shows the VAS scores of patients at six months following surgery. When patients were divided into groups of mild (1-3), moderate (4-7), and severe pain (>7) on basis of VAS score, it was found that majority, 34.61%, had mild pain, 8.97% had moderate pain, and less than 1% had severe pain.
Conclusions: In the present study, author found that chronic pain following inguinal hernia repair causes significant morbidity to patients and should not be ignored. All measures must be taken to suppress early postoperative pain and prevent complications as these lead to development of chronic pain.

Keywords: Inguinal hernia, Pain

INTRODUCTION

A widely accepted definition was provided by a Committee of the International Association for the Study of Pain: 'Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage'.[1] Hernia repair encompassing dissection, use of foreign material and inflammation cause injury to tissue (nociceptive pain) and to nerves (neuropathic pain).[2-4] However, it is believed to be due to entrapment of the ilioinguinal, iliohypogastric or genital branch of the genitofemoral nerve either in the sutures, mesh or scar tissue.[5-7] Both routine preservation and division of the genital branch of the genitofemoral nerve have been advocated to prevent pain.[7-8] Pre-emptive analgesia, type of anesthesia, preservation of nerves, and prevention of postoperative complications are related to development of chronic pain. Author undertook a prospective study to analyse the factors associated with development of chronic pain following inguinal hernia repair.

METHODS

Patients undergoing elective inguinal hernioplasty in the Hospital from March 2016 to March 2017 were included in the study. Seventy-eight patients were present for follow up for a period of 6 months. Patients presenting

with obstructed/strangulated inguinal hernia were excluded from study.

Data were collected by history taking and careful examination of all patients undergoing elective inguinal hernia surgery, there were slight differences in the surgical techniques because of different operating surgeons. All patients underwent Lichtenstein procedure with prolene mesh of dimension 8x15cm. The mesh was fixed with prolene 2.0 sutures and skin closed in layers. Details regarding preoperative characteristics, type of anesthesia, intraoperative finding, and postoperative complication were recorded on a proforma.

The pain was assessed by the Visual Analogue Scale (VAS) preoperatively and on days 1, 2, and 7 and at the end of 6 months by a questionnaire/telephonic conversation. Pain score was classified as mild VAS score 1-3, moderate VAS score 4-7, and severe VAS score >7. Patients complaining of severe pain will be called for follow up for detailed examination and investigated for causes of chronic pain. The collected data was analysed with respect to incidence and factors affecting the development of chronic pain and its management.

RESULTS

The present study was done in our Hospital from March 2016 to March 2017. A total of 78 patients undergoing elective inguinal hernia repair satisfied the inclusion criteria and were available for follow up at end of six months. The patient characteristics are summarized in various Tables 1-7. Majority of the patients were male 97.43% with mean age 49.1 years (range 16-78 years). The VAS scores of patients at six months following surgery (Table 8). When patients were divided into groups of mild (1-3), moderate (4-7), and severe pain (>7) on basis of VAS score, it was found that majority, 34.61%, had mild pain, 8.97% had moderate pain, and less than 1% had severe pain.

Table 1: Distribution of sex.

Sex	Number	Percentage
Male	76	97.43
Female	2	2.56

Table 2: Distribution of preoperative pain.

Preoperative pain	Number	%
Yes	18	23.07
No	60	76.92

Table 3: Duration of symptoms.

Duration of symptoms	Number	%
<6 months	31	39.74
>6 months	47	60.25

Table 4: Distribution of site.

Site	Number	%
Right	34	43.58
Left	40	51.28
Bilateral	4	5.12

Table 5: Type of anesthesia.

Anesthesia	Number	%
Local	0	0
Spinal	72	92.30
General	6	7.69

Table 6: Nerve identification during surgery.

Nerve identification	Number	%
None	21	26.92
Anyone	38	48.71
Two	16	28.51
All three	3	3.8

Table 7: Postoperative complications.

Complications	Number	%
Yes	9	11.53
No	69	88.46

Nine of 31 (29.03%) patients whose symptoms were of less than six-month duration developed chronic pain. Patients with symptom duration greater than six months (48%) developed chronic pain. Duration of symptoms greater than six months significantly affected development of chronic pain.

Table 8: Chronic pain incidence at six months.

Chronic pain VAS score	Number	Percentage
Mild (1-3)	27	34.61
Moderate (4-6)	7	8.97
Severe >6	1	1.28

It was seen that 25% without preoperative pain developed chronic pain whereas 75% of patients with preoperative pain developed chronic pain. When patients with preoperative pain were divided into two groups mild pain (<4 VAS) and moderate to severe pain (>4 VAS), it was seen that patients with significant preoperative pain had higher chances of developing chronic pain.

Majority (92.30%) of patients underwent hernia surgery under spinal anesthesia; this type of anesthesia had significant effect on development of chronic pain. Nerve identification during surgery was none in 26.92%, any one in 48.71%, and all three in 3.8% of cases on ANOVA analysis. No relation was found between nerve identification and development of chronic pain following surgery. It was found that nerve injury significantly

affected development of chronic pain. Postoperative complications in form of hematoma, seroma, or infection were present in 11.53% of cases. It was found that postoperative complication not only increased early postoperative pain but also increased chances of development of chronic pain. On analysis, it was found that development of chronic pain following hernia surgery was dependent upon factors like preoperative pain, type of anesthesia, nerve injury, postoperative complication, and most importantly the early postoperative pain.

DISCUSSION

Implantation of mesh is considered the "gold standard" for the treatment of inguinal hernia repair as the risk of recurrence is half compared to traditional nonmesh techniques. In a multicentre prospective study looking at the incidence of chronic pain, Alfieri S *et al* observed chronic severe pain in 0.5% of patients at 1-year follow-up.[10]

It is not clear from the literature whether mesh repair is associated with increased incidence of chronic pain. Callesen et al, observed a non-significant increase in chronic pain in patients who had mesh repair than compared to patients who had suture repair.[11] The exact cause of the post-herniorrhaphic pain is not clear. Entrapment of the ilioinguinal, iliohypogastric or genitofemoral nerve is thought to be responsible for the pain. Both preservation and routine division of the ilioinguinal and genitofemoral nerves have been advocated.[12] Chronic pain following open inguinal hernia repair can be disabling, sometimes seriously affecting quality of life. It is, therefore, very important to discuss the possibility of resulting chronic severe pain when obtaining pre-operative informed consent.

Author studied 78 patients undergoing elective hernia surgery for development of chronic pain. The incidence of chronic pain in this study was 44.86%. Majority of patients with chronic pain had mild pain (34.61%), moderate pain was found in 8.97%, and severe incapacitating pain was less than 1.28%. Similarly, Poobalan and coworkers found a 15-53% incidence of chronic pain in four studies with pain as the primary outcome.[13]

In this study, mean age of patients was 49.1 years (range 16-78 years). Author found no relation between age and incidence of chronic pain. only 3 patients were female; none of the patients developed chronic pain.

Pain may also be dependent on the method of fixation. Sutures may cause ischaemia, muscle contraction or nerve damage resulting in pain. This is corroborated by the fact that removal of sutures can be an effective treatment in patients with pain.[14,15] According to some authors, suturing through the periosteum of the pubic bone may elicit pain and may also result in (peri) osteitis.[16] To limit the possible nociception due to fixation, some authors advocate the use of absorbable materials.[17] In two trials however randomizing between nonabsorbable sutures and absorbable sutures and fibrin glue no differences in pain sensation were found.[18,19] In a comparable study design no significantly lower pain scores were reported when a mesh was fixated with staples instead of sutures.[20]

The postoperative interval to pain assessment influences the outcome. Lower pain levels are found when follow-up is longer. Also relevant is the instrument for assessing chronic pain. In prospective hernia trials, a questionnaire is the most often used instrument. Compared to the use of a scale instrument like the visual analogue scale or verbal descriptor scale, the questionnaire reveals lower pain levels. One explanation could be a certain threshold to answer positively for pain, whereas with a scale a low score could be reported. Theoretically, the influence of the pain assessment instrument would be diminished with the use of quantitative sensory testing.[21,22] In here, the sensory changes are measured objectively. Most studies found no or weak relationship with subjective pain measures.[23] For understanding aetiology and therapeutic mechanisms however, these objective measurements could provide additional information in future studies.

CONCLUSION

In the present study, we found that chronic pain following inguinal hernia repair causes significant morbidity to patients and should not be ignored. All measures must be taken to suppress early postoperative pain and prevent complications as these lead to development of chronic pain. Early diagnosis and management of chronic pain can remove suffering of the patient. However, the sample size and the follow up period in the current study are relatively short. A larger study sample and longer follow up may be needed before any further conclusion can be made. Great measures must be taken to suppress early postoperative pain with multimodal analgesia. Regular follow up of patient and identification of chronic pain and appropriate treatment improve patient outcome following inguinal hernia surgery.

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