The American Journal of Surgery (2014) 208, 406-411

The American Journal of Surgery®

Clinical Science

Pain and its effects on physical activity and quality of life before operation in patients undergoing elective inguinal and ventral hernia repair

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KEYWORDS:
Hernia;
Pain;
Inguinal;
Ventral

Abstract

BACKGROUND: Pain is the most common symptom associated with hernias. The aim was to assess the frequency of pain and its effects on physical activity and quality of life in patients with inguinal and ventral hernias.

METHODS: All patients undergoing elective inguinal or ventral hernia repair over a 16-month period were asked to complete a questionnaire including a 4-point Verbal Rating Scale, Visual Analog Scale, and Brief Pain Inventory (BPI) to assess pain severity and interference.

RESULTS: One hundred twenty-four patients (72 inguinal, 52 ventral) completed the questionnaire and 75% registered pain on the BPI. There was good correlation between scoring systems (correlation coefficient >.8). Ventral hernia patients had more pain ($P = .037$), interference with mood ($P = .027$), sleep ($P = .004$), relation with other people ($P = .019$), and enjoyment of life ($P = .029$) than their inguinal hernia counterparts.

CONCLUSIONS: The BPI is an easy and effective way of assessing pain and its impact on physical activity and quality of life in patients with an inguinal or ventral hernia with most experiencing mild to moderate chronic pain and disability.

Data from the National Health Service (England) between 2011 and 2012 indicate that there were over 70,000 inguinal, 17,000 umbilical, 8,000 incisional, and 6,000 other ventral hernia repairs carried out.[1] In the United States, the frequency of inguinal and ventral hernia repair was 500,000 and 250,000 cases per year, respectively.[2,3] Pain will be the most common symptom associated with a hernia.[4,5] In most patients, pain will be mild at rest and mild to moderate during activity. However, little is known about what effects this will have on the patient's daily activities or their quality of life.

There are a number of ways of assessing the level of pain a patient experiences, varying from a simple verbal rating scale to the more complex Visual Analog Scale (VAS).[6] However, neither scoring systems will assess the impact of pain on daily activities or the patient's quality of life. The Brief Pain Inventory (BPI) was 1st designed to assess the effect of cancer pain on activity and quality of life and later was also validated for

There were no relevant financial relationships or any sources of support in the form of grants, equipment, or drugs.

This work was not influenced or sponsored by industry or any other organisation.

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Manuscript received October 13, 2013; revised manuscript February 3, 2014

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http://dx.doi.org/10.1016/j.amjsurg.2014.02.011

chronic pain from benign conditions. It is the most well-recognized tool for assessing these issues.[7–12]

The aim of this study was to assess pain and its effects on physical activity and quality of life using the BPI in patients undergoing elective inguinal or ventral hernia repair. The validity of the BPI was assessed by correlating it with the 100-m VAS and 4-point Verbal Rating Scale (VRS) scores.

Methods

Research and ethics approval was granted for this prospective questionnaire-based study analyzing pain severity and pain interference on patients with an inguinal or ventral hernia. A questionnaire was created with 4 parts, the 1st including patient demographic data and the duration of the hernia before surgery. The other 3 parts included a 4-point VRS measuring pain at rest and on movement, a corresponding 100-mm VAS, and the short-form BPI. The BPI uses the 11-point numerical rating scale. There are 4 questions pertaining to the measurement of pain severity, rating pain at its worst and least in the last 24 hours, pain on average, and pain at the time of completing the questionnaire. The BPI Pain Severity Score (PSS) is calculated by adding the 4 scores and calculating the mean. The BPI Pain Interference Score (PIS) is calculated similarly by adding all 7 pain interference measures and dividing by 7. Both give a mean score of a maximum of 10.

All patients admitted over a 16-month period to a single surgical unit for elective hernia repair were included in this study. Those with complex abdominal wall hernias, which include incisional hernia defects greater than 10 cm in diameter, recurrent hernias, stomas, fistulas, and infected mesh, were excluded from this study. All patients with a good understanding of English without visual and significant cognitive or motor impairment were given the questionnaire the day before their operation. Patients were not supervised during the completion of questionnaire to avoid any external influence on the scores.

Statistical considerations

The baseline data were tabulated by hernia type (inguinal or ventral). Categorical data were compared between the 2 groups by chi-square tests or in the case of small sample size the Fisher's exact test. Metric data with a skewed distribution were calculated as a median with interquartile ranges (IQRs). To compare the medians, the data were analyzed using the Mann–Whitney U test. Continuous data were compared using a t test. A P value of .05 or less was considered statistically significant. The Pearson's correlation coefficient was used to determine association between 2 metric continuous variables and the Spearman's rank correlation coefficient was used for ordinal variables. For nominal data, the Cohen's Kappa statistic was used to calculate the level of agreement. The data in Fig. 2 were given as a mean with 90% confidence intervals (CI). This was selected as 95% CI would not exclude the extreme outlier and using the median with IQRs would exclude too many patients, especially in the severe pain category. The statistical analyses were performed using SPSS version 19.0 (SPSS, Chicago, IL).

Results

One hundred twenty-four patients (97 male and 27 female) with a median age of 57 years (range 19 to 84 years) admitted for an elective hernia repair were included in this study. There were 72 inguinal hernia and 52 ventral hernia repairs consisting of 18 incisional, 27 umbilical, and 7 epigastric hernias. There was excellent compliance with completion of the questionnaires. Both parts of the VRS were completed by all patients, 123 (99%) completed the VAS, and 121 (97.6%) answered all questions on the BPI. The patient demographics for the inguinal and ventral hernias are displayed in Table 1. Those electing to have a repair had their hernias for a median of 12 months (IQR: 6 to 36 months). Patients with an inguinal hernia presented significantly earlier for repair compared with those with a ventral hernia (Table 1). Female sex was the only variable associated with increased pain, while age or duration of hernia had no impact on pain intensity (Table 2).

Pain severity and Pain Interference Scores

Ninety-three (75%) of the 124 patients had pain from their hernia on the basis of the BPI "pain on average"

Table 1 Patient demographics

Hernia	Inguinal n = 72 (58%)	Ventral n = 52 (42%)	
Age, mean (SD)			
Years	57.7 (16.7)	52.7 (13.1)	Mean difference 4.97 (95% CI −.59 to 10.52)
Sex			
Male	66 (91.7%)	32 (61.5%)	$P < .001$
Female	6 (8.3%)	20 (38.5%)	
Duration of hernia			
Months (IQR)	9.0 (4.5–30.0)	18.0 (6.3–45.0)	$P = .045$

CI = confidence interval; IQR = interquartile range; SD = standard deviation.