Pain Following the Repair of an Abdominal Hernia

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Abstract

Pain and other types of discomfort are frequent symptoms following the repair of an abdominal hernia. After 1 year, the incidence of light to moderate pain following inguinal hernia repair is as high as 10% and 2% for severe disabling chronic pain. Postoperative chronic pain not only affects the individual patient, but may also have a great impact on relatives and society, and may be a cause of concern for the responsible surgeon. This paper provides an overview of the anatomy, surgical procedures, and disposing factors (age, gender, ethnicity, genotype, previous hernia repair, pain prior to surgery, psychosocial characteristics, and surgical procedures) related to the postoperative pain conditions. Furthermore, the mechanisms for both acute and chronic pain are presented. We focus on inguinal hernia repair, which is the most frequent type of abdominal hernia surgery that leads to chronic pain. Finally, the paper provides an update on the diagnostic and treatment routines for postoperative pain.

Key words Inguinal hernia · Pain · Surgery · Postoperative pain · Anesthesiology · Pathophysiology · Anatomy

Introduction

Abdominal hernia repair procedures are frequently performed and are widely associated with a fast recovery. Unfortunately, emerging evidence shows that chronic pain and other types of sensory disturbances and discomfort (e.g., genital dysfunction) may persist or arise postoperatively. In fact, chronic pain appears to be more common in comparison to recurrence of the hernia. Following an inguinal hernia repair procedure, greater than 30% of the patient population complained of varying degrees of pain that persisted for at least 1 year postoperatively (see Fig. 1 for a comparison with other common surgical procedures). Of these patients, 6%–20% were affected in their daily activities. The treatment of these rather common chronic pain conditions have proven to be complicated, thus forcing the surgeons to involve other specialists and even multidisciplinary pain centers. Furthermore, these patients did not regain their preoperative physical state and thereafter encountered economic and social problems.

The present review discussed the basic anatomy, surgical procedures, disposing factors such as age, gender, ethnicity, genotype, previous hernia repair, pain prior to surgery, psychosocial characteristics, and the different surgical procedures. Furthermore, we present the mechanisms of acute and chronic pain and the diagnostic and pain treatment routines related to inguinal hernia repair. We only describe here the details for the repair of the inguinal hernia, since this is the most frequent type of abdominal hernia that is linked to the development of postoperative pain. We anticipate that the pathogenesis for the development of pain is independent of the type of abdominal hernia repaired.

Methods

A search of the PubMed database was performed in December 2007 in order to retrieve papers related to the specific areas of pain following surgical inguinal hernia repair. For the purpose of reviewing the anatomy, surgical and diagnostic procedures, the classification of postoperative pain, and the treatment options, the word combination of pain and hernia was used (more than
The present paper is based on the selected articles that were found in this search and is supplemented by other relevant sources.

**Definition of Pain**

Postoperative pain is defined as an unpleasant sensation in the region related to the surgical procedure. Acute versus chronic postoperative pain is defined as pain persisting for shorter or longer than 3 months.

**Disposing Factors**

The disposing (predictive risk) factors for chronic pain following hernia repair are the same as that of most other surgical procedures and are comprised of age, gender, ethnicity, genetic disposition, previous inguinal hernia repair, and pain prior to surgery. Furthermore, pain following immediately after surgery, the mode of incision, injection of local anesthetics, suturing open non-mesh technique, surgical dissection, electrocoagulation, hematoma formation, postoperative infection, psychosocial characteristics, previous surgery or radiation in the same area, body mass index above 25, and neurotoxic chemotherapy dispose for chronic pain. A selection of these disposing factors are described in detail in the following sections of this paper.

**Age**

Adult patients under 40 years of age complain more frequently of postoperative pain in comparison to elderly patients. This phenomenon may be caused by reduced physical activity in the individuals who are middle-aged or older, for whom the nociceptive neuroendocrine mechanisms are relatively dulled.

**Genetics**

A knowledge of the patient’s genotype may be beneficial because the emerging evidence suggests that pain perception (phenotype) and the development of chronic pain are influenced by the genetic constitution (genotype), e.g., single nucleotide polymorphism in the catechol-O-methyltransferase and μ opioid receptor OPRM1 genes. However, not all the evidence from these gene-pain studies concurs, and it is therefore premature to use gene-mapping to predict and treat pain conditions.

**Gender**

Clinical and experimental studies show that women are more susceptible to developing chronic pain. Women demonstrate a higher susceptibility to temporal summation and a less efficient pain habituation, as well as a lower heat pain threshold. The differences in pain perception between men and women are likely to be caused by hormonal influences and by differences in the opioid system. In fact, experimental pain studies suggest that women experience pain differently during the menstrual cycle, after menopause, and during the use of contraceptives. These findings have been questioned because of the methodological weaknesses in the study design, and because the findings of the experimental studies are generally less convincing in comparison to the findings of the clinical studies.