Adhesive Intestinal Obstruction in children:

Ain Shams pediatric surgery unit (A Model)

An Essay

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Kenawi Khiebar Zaki

Contents

List of Abbreviations

AIA	:	Acquired ileal atresia
ASBO	:	Adhesive small bowel obstruction
CMC	:	Carboxymethylcellulose
CPT	:	Camptothecin loaded films
CT	:	Computed tomography
DKT	:	Daikenchuto, Traditional Japanese Medicine
ePTFE	:	Expanded polytetrafluoroethylene
FMF	:	Familial Mediterranean fever
HA	:	Hyaluronic acid
HA-CMC	:	Combined Hyaluronic Acid and Carbox ymethylcellulose
HBO	:	Hyperbaric oxygen
IBD	:	Inflammatory bowel disease
KID	:	Kids' Inpatient Database
LA	:	Laparoscopic appendectomy
LLA	:	Laparoscopic lysis of adhesions
LOS	:	Length of hospital stay
MRI	:	Magnetic resonance imaging
NGT	:	Nasogastric tubes
NOM	:	Non operative management
OA	:	Open appendectomy
OLA	:	Open lysis of adhesions

List of Abbreviations (Cont.)

OLA	:	Open lysis of adhesions
ORC	:	Oxidized regenerated cellulose
SBO	:	Small bowel obstruction
SBR	:	Small Bowel Resection
TRPV1	:	Transient receptor potential vanilloid type 1
US	:	Ultrasonography
WCC	:	White cells count
WSCA	:	Water soluble contrast agent

List of tables

List of Figures

Introduction

Adhesions are abnormal fibrinous structures in the abdominal cavity. These structures are connections between serosal and/or non-serosal surfaces of the internal organs and the abdominal wall, at where there should be no connection. ***(Hammoud et al., 2004 and Vrijland et al., 2003).***

Intra-abdominal adhesions develop after abdominal surgery as part of the normal healing processes that occur after damage to the peritoneum. Over 2005 and 2006, much research has gone into understanding the biochemical and cellular processes that lead to adhesion formation. The early balance between fibrin deposition and degradation seems to be the critical factor in adhesion formation. Although adhesions have some beneficial effects, they also cause significant morbidity, including adhesive small bowel obstruction, infertility and increased difficulty with re-operative surgery, although several strategies have been employed over the last years to prevent adhesion formation while not interfering with wound healing ***(Jo-Anne et al., 2007)***.

The majority of adhesive intestinal obstruction involves the small bowels, and the sequelae of small intestinal obstruction in children are severe due to rapid onset of fluid/electrolyte derangement, nutritional problems, risk of aspiration and sepsis ***(Markogiannakis et al., 2007)***.Adhesive intestinal obstruction makes up to 60 to 80 percent of admissions for intestinal obstruction, the incidence of postoperative adhesions may be as high as 92.9 per cent and may lead to a variety of clinical problems including intestinal obstruction***(Kossi et al., 2004)***.

Adhesive intestinal obstruction caused by a wide range of recognized inflammatory stimuli which cause peritoneal injury including; operative injury, bacterial peritonitis, radiotherapy, ischemic injury and foreign body reactions, e.g. starch talc and chemical injury ***(Hellebrekers et al., 2000).***

Aim of the work

This is a narrative review of currant literature to illuminate the state of knowledge as regard adhesive intestinal obstruction in children mainly its etiology, methods of diagnosis, treatment, and prevention, putting it in contact of cases seen in Ain Shams pediatric surgery unit over the period from Janury 2009 to July 2010 as a model.

Overview

Introduction

Adhesive small bowel obstruction (ASBO) is associated with long-term morbidity after abdominal operations in both children and adults ***(Aguayo et al., 2010).***

1-ASBO complicates all types of abdominal operations in children and adolescents, but the rates vary by age and type of initial operation. A population-based analysis of Scottish children demonstrated a 4.2% rate of ASBO readmission in the 5 years after abdominal surgery in children <5 years of age, and a 1.1% rate in children <16 years of age ***(Grant et al., 2006)***.

The rate was highest for children who underwent surgery on the ileum (9.2%), compared with 6.5% after general laparotomy and 2.1% after colonic surgery ***(Grant et al., 2006)***.

Similarly, ASBO occurs in 3.8% of patients after treatment of intra abdominal tumors, including 8.9% of patients with Wilms tumor ***(Aguayo et al., 2010).***

ASBO may be more common with some specific abdominal operations, including Ladd procedure ***(Murphy et al., 2006)***.

Obstruction is uncommon after appendectomy, however, occurring in <1% of patients ***(Grant et al., 2008)***.

2-Adhesive intestinal obstruction may also result from inflammatory conditions mainly familial Mediterranean fever. Familial Mediterranean fever (FMF) is characterized by recurrent episodes of peritonitis. Adhesive intestinal obstruction may be in some cases the only presentation of FMF. When an atypical bout of pain fails to resolve spontaneously and rapidly, the surgeon must consider the diagnosis of intestinal obstruction due to an adhesive band with the

associated risk of strangulation with bowel necrosis ***(Moradian et al., 2013).***

3-Another cause for adhesive intestinal obstruction is traumatic injury. The trauma healing by fibrotic adhesions result in secondary bowel obstruction ***(Huang, 2000).***

4- Less commonly adhesions may form as result of intra peritoneal infection ***(Jo-Annep et al., 2007)***

Comparison between the laparoscopic and open approach in appendectomy

Although rare, small bowel obstruction SBO after appendectomy requiring operative adhesiolysis remains a real short- and long-term complication with potentially severe morbidity. Several studies have described the relative risk of postoperative SBO subsequent to open appendectomy (OA). ***Andersson (2001)*** reported a 0.41% incidence in the first 4 weeks and 0.63% after 1 year.

However, in the era of laparoscopy, there is little known of the frequency of adhesive SBO after laparoscopic appendectomy (LA) compared with OA, especially in children. In ***Tsao et al., (2007)*** study, the overall incidence of SBO after appendectomy (laparoscopic and open) was 0.7%, which is comparable with many other studies. However, there remained a disproportionate occurrence of SBO in the OA group compared with the LA group. Laparoscopic operations are assumed to cause less peritoneal adhesions and are postulated to have a lower incidence of adhesive SBO.

Risk factors:

Several factors leading to the degree of inflammation and possible predisposition to postoperative adhesions should be considered. First, the duration of illness and degree of perforation at time of presentation such as generalized peritonitis or focal abscesses could result in increased inflammation.