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LAPAROSCOPIC TREATMENT OF INCISIONAL VENTRAL HERNIAS (LITERATURE REVIEW)

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Abstract

Postoperative ventral hernia is a fairly common complication in abdominal surgery, which, according to different authors, occurs in 2-15% of patients who underwent laparotomy surgery. There are several classifications of incisional ventral hernias, but none of them fully meets all the requirements, each has drawbacks [9]. Among the Russian classifications, the most common and convenient in clinical practice is the classification developed by K.D. Toskin and V.V. Jebrovsky. According to various authors, the incidence of complications after laparoscopic hernioplasty ranges from 2 to 26%, the recurrence rate of the disease is from 0 to 17%, the average duration of the operation was 82-117 minutes, and the duration of the patient's stay in the hospital is from 2 to 6 days. Seroma formation is a common problem when using synthetic prostheses. The frequency of their formation after laparoscopic and laparotomy formations is approximately the same. But seromas formed after laparoscopic interventions do not lead to infection and wound suppuration.

Keywords: incisional ventral hernia, treatment, laparoscopy, complication.

抽象的

术后腹疝是腹部手术中相当常见的并发症，据不同的作者称，在接受剖腹手术的患者中发生率为 2-15%。切口腹疝有几种分类，但没有一种完全满足所有要求，各有缺点[9]。在俄罗斯的分类中，临床实践中最常见和最方便的是 K.D. Toskin 和 V.V.杰布罗夫斯基。据多位作者介绍，腹腔镜疝修补术后并发症的发生率为 2% 至 26%，疾病复发率为 0% 至 17%，手术平均持续时间为 82-117 分钟，患者的持续时间为住院时间为 2 至 6 天。使用合成假体时，血清肿形成是一个常见问题。它们在腹腔镜和开腹手术后形成的频率大致相同。但腹腔镜手术后形成的血清肿不会导致感染和伤口化脓。

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关键词：切口腹疝·治疗·腹腔镜检查·并发症。

Introduction

Incisional hernia is also known as incisional ventral hernia and is one of the most common complications of abdominal surgery [1]. This is an iatrogenic condition [2] in which it is not possible to close the closing lines of the abdominal wall after a previous surgical incision. In rare cases, after abdominoperineal resection of the rectum with insufficient perineal wounds. The pathogenesis is complex and not fully understood. The size of the hernia can range from very small to very large. Probably, the incidence is underestimated and ranges from 3.8 to 11.5% [4, 15]. The incidence depends on a number of factors. The most important causative factors are wound infection and wound dehiscence. Other predisposing factors are bowel surgery, bloating, suture type, wound closure technique, chest infection, old age, male gender, and obesity [6].

Historical perspective. The rapid development of abdominal surgery in the 19th century was followed by incisional hernias as a complication [14]. McDowell excised an ovarian cyst in 1809, Billroth performed a partial gastrectomy in 1881, and Langenbuch performed a cholecystectomy in 1882. These were some of the procedures that led to the incisional hernia. Over the past hundred years, attempts have been made to treat such hernias, but they have not been crowned with success. Such attempts at recovery led to more complications and increased relapses [14]. Gerdyand Maydl treated incisional hernias in 1836 and 1886, respectively, while Judd in 1912 and Gibson in 1920 described methods based on anatomical dissection [15]. Gallie and Le Mesurier used autologous fascial strips for plastics in 1923 [16]. Hernia repair is one of the first procedures in which implants made of

foreign material were used. Bartlett and McGavin in 1903 and 1909, respectively, advocated the use of silver wire filigree [17, 18]. Witzel and Geopel advocated the use of such a silver wire in 1900 [14]. Koontz and Throckmorton also used tantalum gauze in 1948 [19, 20]. The disadvantage of using these metals was early fragmentation and hernia recurrence. It has also been noted that metal fragments cause sinuses and intestinal perforation. Shortly thereafter, synthetic plastics, flexible plastic sheets and a polyvinyl alcohol sponge were also introduced [21, 22]. The modern era of hernia repair began in 1958 when Usher et al. reported their experience with polyamide mesh [23]. More recently, woven polyester mesh, polypropylene mesh and expanded polytetrafluoroethylene (PTFE) came into use. It was these materials that revolutionized incisional hernia surgery.

Suture techniques for incisional hernia repair were introduced in the early 20th century [14]. The various sutures used included strips of fascia lata, skin, and animal tendons. Silk, cotton and linen were also used. Although the darning technique is excellent, it has not gained widespread acceptance due to the lack of a suitable suture material. In 1948, Abel reported on his experience of using stainless steel monofilament wire to treat hernias and close abdominal incisions [24]. Hunter also reported on his experience using nylon monofilament and suturing only the anterior rectus sheath [25].

Abrahamson and Elder modified this nylon suture technique and, since 1973, have used the lace method to repair incisional hernias [26]. The technique appears to be simple to perform,

extraperitoneal, and associated with a low relapse rate.

Postoperative ventral hernia is a fairly frequent complication in abdominal surgery, arising, according to different authors, in 2-15% of patients who have undergone laparotomy [4-7]. In about 50% of cases, postoperative ventral hernias develop within the first 2 years after surgery and 74% after 3 years [8, 36].

There are several classifications of incisional ventral hernias, but none of them fully meets all the requirements, each has drawbacks [9]. Among the Russian classifications, the most common and convenient in clinical practice is the classification developed by K.D. Toskin and V.V. Zhebrovsky (1990) [10]. A feature of this classification is that the basis for determining the size of a hernia is based on the anatomical principle of dividing the abdominal wall into 9 regions. This allows you to measure the size of the hernia with the area of the anterior abdominal wall:

- small (does not change the shape of the abdomen and is determined only by palpation);
- middle (occupies part of the region of the anterior abdominal wall, protruding it);
- extensive (completely occupies the area of the anterior abdominal wall, deforming the patient's abdomen);
- giant (occupies 2-3 areas or more, sharply deforms the abdomen, prevents the patient from walking).

Of the foreign ones, the most acceptable classification proposed by J. Chevrel and A. Rath (1999) is the SWR classification, internationally recognized by the XXI International Congress of Herniology in Madrid [9, 11]. This classification includes three positions - S, W, R, S - localization of the hernia: median (M), lateral (L) and combined (ML); W the width of the hernial

orifice: W1 - less than 5 cm, W2 - from 5 to 10 cm, W3 - from 10 to 15 cm, W4 - more than 15 cm; R - the presence of a relapse: R1, R2, R3, etc. It is these parameters that are considered the main ones in determining the indications for the choice of one or another type of abdominal wall plasty. However, this classification does not take into account a number of important parameters: 1) localization in relation to the umbilical region (above or below), and since the structure of the abdominal wall is different, in accordance with which the choice of the plastic method will be different; 2) reducibility of the hernia; 3) the presence of an infringement of the hernia; 4) the external volume of the protrusion, which can be large even with the small size of the hernial orifice [12].

New advances in ventral hernia repair technology should reduce the recurrence rate and common problems associated with open hernia repair. The number of relapses after laparotomy for ventral hernias varies from 25 to 52% [13].

The unsatisfactory results of these operations necessitated the use of additional strengthening material for hernioplasty. For this purpose, the technology of prosthetics of the abdominal wall with mesh synthetic polypropylene prostheses was developed [1, 2]. These materials have elasticity, biological and chemical inertness, porosity, mechanical strength [1, 14]. The use of these materials made it possible to reduce the number of relapses, while adding several variants of complications, such as infection of the prosthesis, detachment and migration of the prosthesis in the abdominal cavity, perforation of the hollow organ, and the formation of intestinal fistulas [15-17]. The use of laparoscopic ventral hernia repair can reduce the incidence of infection and recurrence [15, 18, 19].

Now there are 4 main options for the location of the prosthesis for the repair of incisional hernias of the anterior abdominal wall:

- with nadaponeurotic fixation of the prosthesis (onlay);
- with preperitoneal fixation of the prosthesis (sublay);
- without reducing the volume of the abdominal cavity (inlay);
- with intermuscular fixation of the prosthesis [7].

Currently, endosurgical operations are the "gold standard" in many surgical clinics and the main therapeutic and diagnostic method [20, 37].

Laparoscopic mesh reconstruction.

This method of treating incisional hernia has appeared recently. It appeared in the 1990s [5] and was first reported in 1993 [13]. This minimal access surgical procedure was expected to produce the same recurrence rate as open treatment. The additional benefits of shorter recovery times and shorter hospital stays were expected to make it more attractive as well. It is also believed that the procedure causes fewer complications [5]. All reports based on the literature search in Medline (there were about 14 by 2002) describe mesh placement in the intraperitoneal position and the methods used were similar [5]. All agree that an overlap of at least 3 cm between the mesh and the edge of the fascia is necessary for good results [5]. Most authors did not use drainage, in contrast to the mesh repair method, in which drainage is used everywhere [5]. In the presence of extensive adhesions, it is difficult to create an adequate pneumoperitoneum required for the procedure. This condition prevents safe laparoscopic repair [38]. In such conditions, the plastic can be converted to an open type.

Laparoscopic hernia repair is increasingly being used to treat patients with complex incisional hernias. The use of laparoscopic interventions allows avoiding large volumes of operations, which leads to a decrease in the incidence of postoperative complications associated with an operating wound [24, 25]. The widespread introduction of laparoscopic operations has led to a decrease in the trauma of surgical interventions, a reduction in the terms of rehabilitation of patients, their stay in the hospital and, accordingly, to a decrease in the monetary costs of treating one patient with the same results as with open surgical interventions.

Recent reports on this problem have confirmed a decrease in the incidence of postoperative complications, a shorter rehabilitation period for patients and a low number of relapses [19, 26, 27].

It should be noted that the quality of life of patients who underwent laparoscopic intervention, in contrast to patients after laparotomy, is noticeably higher. After laparoscopy, patients return to their normal lifestyle earlier and can do normal physical activities earlier.

The main stages of laparoscopic hernioplasty are the separation of adhesions, determination of the boundaries of the hernial defect and, in fact, hernioplasty. The size of the prosthesis should exceed the size of the defect by 5-6 cm, the hernial sac is preserved. The prosthesis is fixed to the aponeurosis with a herniostapler from the side of the abdominal cavity. Some surgeons additionally apply through sutures through the abdominal wall with a needle to suture trocar wounds and tie them over the aponeurosis. Peritonization of the prosthesis is important for its isolation from the abdominal organs, which makes it possible to reduce the likelihood of developing early adhesive intestinal obstruction

and abdominal infiltrates. Trocar insertion sites in patients with incisional ventral hernias are not standardized and are made where it is more convenient and safe [2, 7, 26, 28].

According to various authors, the incidence of complications after laparoscopic hernioplasty ranges from 2 to 26%, the recurrence rate of the disease - from 0 to 17%, the average duration of the operation was 82-117 minutes, and the duration of the patient's stay in the hospital - from 2 to 6 days [2, 18, 19, 29, 38].

Seroma formation is a common problem when using synthetic prostheses. The frequency of their formation after laparoscopic and laparotomy formations is approximately the same. But seromas formed after laparoscopic interventions do not lead to infection and wound suppuration [30, 31]. This complication is considered significant if it does not resolve on its own within 6 weeks. B. Heniford et al. recommend aspirating seromas that are symptomatic [19, 35].

The main disadvantages of laparoscopic hernioplasty, like other laparoscopic operations, are the need for expensive equipment, special training of the surgeon, as well as performing the operation under conditions of a tense pneumoperitoneum.

The development of alloplastic techniques began at the turn of the 19th and 20th centuries. Materials and methods of implant fixation have changed over time. Currently, the most commonly used prostheses are made of polypropylene (Marlex, Prolene) and polytetrafluoroethylene (ePTFE - Gore-Tex, DualMesh). In addition, composite materials consisting of polypropylene and polytetrafluoroethylene (Composix, Ventralex) have entered the market, which are becoming widespread abroad [7, 14, 15, 32-36].

Conclusion

The main criteria for choosing a prosthesis are resistance to infection, biological inertness to tissues, speed and quality of implantation. These qualities are determined by both chemical and physical properties. If the pores of the fibers of the material are less than 10 microns, then in the wound chronic infection of the material occurs, since bacteria in such pores are able to multiply and reliably hide from neutrophils, the size of which is 10-15 microns [2, 7]. Thus, the implant should not consist of braided, but of monofilament threads. The porosity of the tissue determines the time and quality of its implantation into the body. If the pore size of the material exceeds 75 microns, then it grows with collagen fibers and fibrocytes within a month. If the pores are smaller, the histiocytic infiltration of the prosthesis predominates, which leads to its weak fixation in the tissues [7].

Prostheses based on polypropylene mesh are non-allergenic, highly resistant to infection, strong and inert to tissues [33]. Another synthetic material that is widely used is polytetrafluoroethylene, the adhesiveness of which is less than that of polypropylene, which allows it to be placed inside the abdominal cavity in close contact with internal organs [7, 21, 37]. The negative aspect of polytetrafluoroethylene is chronic infection of the prosthesis [38]. Therefore, the use of polytetrafluoroethylene is currently limited mainly by laparoscopic hernioplasty with intraperitoneal placement of the prosthesis.

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