ABCDDV/821

ABCD Arq Bras Cir Dig
2011;24(4): 328-333

Review Article

MANAGEMENT OF PARAESTOMAL HERNIAS

Manejo das hérnias paraestomais

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ABSTRACT - ***Introduction*** - Paraestomal hernia represents a late complication of virtually all intestinal stoma. Clinical manifestations range from a simple cosmetic problem to the strangulation of the herniated contents. The degree of disability produced by the hernia is variable. There is a wide range of procedures using or not using prosthetic material of different specificity and controversial results. ***Methods*** - Was performed a literature review on sites PubMed, BIREME, SciELO with the headings paraestomal hernias, surgery, hernia, colostomy and ileostomy. Were selected mainly studies with the application of surgical techniques and added to the authors' clinical experience. ***Conclusion*** - Despite various techniques and available devices to handle the paraestomal hernias, there is no ideal method that may be recommended for all cases. Thus, a careful analysis of risk factors can choose the best treatment option that should be done individualizely to each case.

HEADINGS - Paraestomal hernias. Surgical treatment. Hernia. Colostomy. Ileostomy.

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Financial source: none
Conflicts of interest: none

Received for publication: 27/01/2011
Accepted for publication: 30/03/2011

RESUMO – ***Introdução*** – A hérnia paraestomal representa complicação tardia de virtualmente todos os estomas intestinais. As manifestações clínicas oscilam desde um simples problema estético até o estrangulamento do conteúdo herniado. O grau de incapacidade produzido pela hérnia é variável. Existe gama muito grande de procedimentos utilizando ou não material protético de variada especificidade e de resultados controversos. ***Métodos*** – Foi realizada revisão de literatura nos sites de pesquisa PubMed, Bireme e Scielo, com os descritores hérnias paraestomais, tratamento cirúrgico, hérnia, colostomia e ileostomia. Selecionaram-se, principalmente, os estudos de aplicação de técnicas cirúrgicas e adicionou-se a experiência clínica dos autores. ***Conclusão*** - Apesar das várias técnicas e meios à disposição do cirugião para o manuseio das hérnias paraestomais, ainda não há método ideal que venha a ser recomendado para todos os casos. Assim, a análise criteriosa dos fatores de riscos do paciente pode ajudar a escolher a melhor opção de tratamento que deve ser individualizada a cada caso.

DESCRITORES - Hérnias paraestomais. Tratamento cirúrgico. Hérnia. Colostomia. Ileostomia.

INTRODUCTION

Paraestomal hernia represents a late complication of intestinal stoma being virtually inevitable[10]. Clinical manifestations range from a simple cosmetic problem to the strangulation of the herniated contents. The degree of disability produced by the hernia is variable. Not only the pain and cosmetic changes represent important aspects, but especially the possibility of soiling resulting from the difficulty of installing the collector device or impossibility of irrigation result in significant limitation of social function. Surgical repair can be tricky because many surgical techniques have been described and often may have a recurrence as a result of an error in the execution or in surgical option. More modernly, the techniques of direct repair without mesh and implementation techniques have been replaced by a prosthesis both open and laparoscopically done. The use of prostheses for repair certainly led to improvements in surgical outcomes, but the occurrence of relapse is located above than desirable. This last impression is the engine of attempts

to prevent its occurrence through the prophylactic use of prostheses at the time of construction of the stoma.

Paraestomal hernia is a type of incisional hernia that occurs at the site of the stoma[7]. Represents the most common complication associated with the production of intestinal stoma.

The difficulty of estimating its incidence is attached to the vagueness of the concept, the variability in the duration of postoperative follow-up and is also associated with the fact that in many cases the hernia produces no symptoms or impair daily activities[21,41]. Another factor that results in significant inaccuracy when estimating its incidence is associated with the type of stoma, terminal or in loop. Another uncertainty is the concept that in many cases, there is a weakness of the abdominal, not a true hernia[26].

The incidence varies significantly and needs to be prospectively determined. It is estimated that it occur between 1.8% and 28.3% of patients with terminal ileostomies, between zero and 6.2% of loop ileostomies, between 12% and 48% of colostomies and between zero and 30% of patients with loop colostomy[5]. Pilgrim et al.[29] recently published prospective study in 90 patients and observed occurrence of paraestomal hernia in 33% of cases.

There are classifications based on the location of exteriorized content and also the type of content of the hernial sac, if omentum or small intestine. But the practicality of these classifications is limited.

METHODS

Literature review was conducted on sites PubMed, BIREME, SciELO, with the headings paraestomal hernias, surgery, hernia, colostomy and ileostomy. Were selected mainly studies related to surgical techniques and added to it the clinical experience the authors.

Clinical picture and etiology

Many patients are asymptomatic. The most common clinical manifestation is the presence of bulging in the region of the stoma with or without pain, localized or diffuse in back. Bloating and nausea are common. Incarceration is the complication that should be avoided. Just as for other hernias of the anterolateral abdominal wall, it is estimated that for those narrow neck and associated with low muscle weakness in place, the risk of imprisonment may be increased.

Its cause is still under debate. For herniations that occur soon after the construction of the stoma, the technical error seems to be the causal factor. Thus, the creation of an excessively large aponeurotic defect or non-exteriorization of the stoma through the rectus abdominalis are the most common technical errors. As for hernias that occur late, several factors seem to be involved. Among them stand out[9,29] urgent operation, infection, obesity (more specifically waist circumference greater than 100 cm)[9], chronic obstructive pulmonary disease and age.

Many studies have shown that the size of the aponeurotic defect to be created during the exteriorization of the intestinal loop should not be greater than 2.5 cm and 3.0 cm, ileostomies and colostomies. There remains, however, under debate if the creation of a subperitoneal pathway can prevent the occurrence of the hernia. Among the factors associated with surgical technique, the location and size of the derivation also seems to be of particular importance. Pilgrim et al.[29] in a prospective study found that for every increase of 1 mm in size of the defect created surgically, the risk of developing hernias increases by 10%. The higher the aperture, the greater the tangential force that tends to ward off the edges of the stoma resulting in hernia. This observation of tensile forces in the abdominal wall helps to explain the lower incidence of hernias after ileostomies[26].

Indications and surgical treatment options

In general, it is understood that paraestomal hernias produce no symptoms and should not be operated.

The most common indications for surgery include pain, strangulation or bowel obstruction (emergency operation), skin ulceration, fistula, recurrent intestinal obstruction, difficulty in fixing the collector device, difficulties in cosmetic appearance.

Multiple approaches to correct them have been reported with variable results of complications and recurrence. It seems that the choice of surgical treatment should be individualized in order to offer lower morbidity associated with the resolution of the set of signs and symptoms that led to the indication of the operation.

Direct repair without prosthetic

First described in 1965 by Thorlakson[40], is performed by a peristomal incision about 5 cm from the mucocutaneous transition. The stoma and hernial sac are dissected, the bag is dried and proceed to direct repair of aponeurotic defects by points of nonabsorbable sutures. Recurrence associated with this repair is between 46% and 100%[3,6].

It is a simple option and should be used in cases of early hernias. In these situations, it is likely that the aponeurotic weakness in the vicinity of the stoma is minimal and therefore there is no need to use prosthesis since the infectious complications related to it are difficult to treat and require its removal[1]. The mesh use does not represent zero

risk of relapse. The notion that no repairs should be done without reinforcement by biological or synthetic prosthesis has gained the preference of most surgeons.

Transposition of the stoma

Historically, the most common approach for the treatment of hernias was paraestomal transposition or relocation of the stoma. Consists of performing laparotomy, and put the intestinal segment at a new location of the anterior abdominal wall. Additionally proceeds to repair the site where the stoma was originally located. There seems to be more disadvantages than advantages to this surgical option. The disadvantages of this approach are: relaparotomy (which can lead to incisional hernia); the creation of a new stoma site which could accommodate a new hernia; possibility of failure of the repair site that housed the colostomy.

The transposition is technically superior to the repair without regard to the occurrence of relapse, but at the cost of increased morbidity[6]. Generally speaking, the transposition of the stoma is preferred when there is recurrence after direct repair with a prosthesis or when the hernia is associated with paraestomal local infectious complications that preclude the use of prosthesis, such as fistulas.

Direct repair with prosthesis

Hopkins and Trent seems to have been the pioneers in trying to direct repair of paraestomal hernias with the use of prostheses. Used for both marlex mesh[17]. What seems to be delayed for decades the use of nonabsorbable synthetic prosthesis material, was the observation of infectious complications such as fistulas in contaminated regions[28]. However, the high rate of recurrence observed after the repair without mesh as well as the knowledge of the existence of disturbances in the formation and composition of collagen associated with paraestomal hernias stimulated the use of meshes.

The principles of repair without tension are also applied in these hernias with the use of meshes. The repair techniques with implants can be performed with or without laparotomy. For the techniques without laparotomy, the incision in the skin and subcutaneous tissues can be carried out at or near the stoma. The prosthesis can be placed above the aponeurotic (onlay technique) or below, preperitoneal (sublayer technique). Finally, operations can be performed laparoscopically.

To carry out the operations with superficial prosthesis (onlay), is currently defending an incision distant from the site of the stoma. If there are previous laparotomy incision, it may be used. Through the incision, the aponeurosis, the defect and the hernia sac are dissected. The defect is repaired without tension. Despite the erosion produced by the exteriorized colon is rare, option is to suture the edge of the mesh to the aponeurosis approximately 5 mm outside the margin of aponeurosis defect without leaving the mesh in contact with the stoma. The drainage from the subcutaneous space-opening is carried out with vacuum tube in a closed system and seems to help to prevent seroma formation. These authors, as a rule, do not practice suturing of the exteriorized intestinal segment to the edges. Rosin and Bonardi[32] advocate the realization of a peristomal incision about 2 cm from the mucocutaneous transition. Leslie[23] an L-shaped incision distant 10 cm from the site of the stoma with an incision comprising part of the previous laparotomy incision and Tekki et al.[38] advocate the realization of a semicircular incision.

The techniques with superficial placement of the mesh (on the aponeurosis) gain the preference of most surgeons, because they avoid laparotomy as demonstrated by the analysis of Table 1. There are no studies comparing the various options of mesh position. Thus it is difficult to establish the superiority of one technique over another. The placement of the mesh in preperitoneal layer (sublayer) requires greater peristomal dissection and seems to be associated with increased risk of infectious complications. The occurrence of relapse after direct mesh repair is between 0% and 26%.

TABLE 1 - Results of surgical treatment of paraestomal hernias by direct repair or by laparotomy with a prosthesis

Author	N	Approach	Prosthesis	Position	Recurrence (%)
Alexandre and Bouillot[2]	7	Local	Polypropylene	Retromuscular	10
Hofstetter[16]	13	Laparotomy	PTFE	Retromuscular	0
Steel[34]	58	Local	Polypropylene	Preaponeurotic	26
Rieger[32]	19	Local	Polypropylene	Preaponeurotic	11
Stelzner[35]	20	Laparotomy	PTFE	Intraabdominal	15
DeRuiter and Bijnen[9]	46	Local	Polypropylene	Preaponeurotic	16
Logman and Thomson[24]	10	Local	Polypropylene	Retromuscular	0
Gúzman-Valdivia[12]	25	Local	Polypropylene	Preaponeurotic	8

PTFE = polytetrafluoroethylene

Laparoscopic repair

The first surgical laparoscopic paraestomal hernia treatment was published in 1998 by Porcheron[30]. After lysis of adhesions and partial reduction in contents of the hernial sac, the authors reinforced the aponeurotic defect and applied PTFE prosthesis (polytetrafluoroethylene), settled with the stapler.

The long-term results with the use of prosthesis for laparoscopic hernia repair are not yet known, but the immediate outcomes of morbidity, pain and infectious complications seem reduced with the use of laparoscopy. There is no evidence that relapse is different from that observed after the repair

by laparotomy. The incidence of recurrence after laparoscopic repair is estimated between 0% and 40% (Table 2)

TABLE 2 - Results of surgical treatment of paraestomal hernias by laparoscopy

Autor	N	Técnica	Recidiva (%)
Le Blanc[22]	12	Keyhole	8
Hansson[13]	55	Keyhole	2
Mancini[25]	25	Sugarbaker	4
Berger e Bientzle[4]	66	Sugarbaker	12
Hansson[14]	55	Keyhole	37

Controversy persists about the extent of the dissection of the sac and how to fix the mesh in the intraperitoneal position with the aid of staples, stitches or sutures passed through the abdominal wall. Another variable technique concerns the placing of the mesh. In the option of Voitk modified by Sugarbaker[40], the prosthesis does not need to be cut and can cover the hernia defect in a manner similar to that described in the open approach[36]. The prosthesis is applied directly against the hernia defect and "compresses" the colon against the wall.

In the keyhole technique (or keyhole), prosthesis is radially opened at the center removing a circle (there are already commercially available prostheses in this configuration). The colon is involved by the defect in the prosthesis and it is fixed to the aponeurosis[15]. In both techniques, the mesh should be set to overcome the defect circumferentially in at least 5 cm.

Extrapolating the results that are obtained with the management of incisional hernias, so far, the access seems best indicated by video in smaller hernias. The resulting cosmetic effect of the laparoscopic repair of large hernias seems inferior to that achieved by open procedure despite the lower morbidity associated with laparoscopy.

So far, it can be said that the results of laparoscopic treatment of paraestomal hernias is disappointing to some degree. For example, the series of Hansson et al.[14], one of the most important in literature. Comprised 55 patients (45 first treatment and 10 recurrent) operated by laparoscopy using the keyhole technique, diffused by the author himself, when the prosthesis is fenestrated and adjustable to each patient. After a mean follow-up of 36 months, the relapse was 37%. This result led the authors to conclude that the recurrence rate for this type of laparoscopic repair is "unacceptably high" and that the solution would be attached to the development of a mesh less distensible and less prone to fractures.

In a comparative study at the Mayo Clinic and published by McLemore et al.[27], 39 patients undergoing conventional paraestomal hernia repair were compared with 19 undergoing laparoscopic repair. The operative time was higher for the operations conducted by video, but the duration of hospitalization and the incidence of infectious complications was similar for both groups indicating no immediate advantage associated with laparoscopic repair.

Use of bioprosthetic

Biological prostheses received this name because they are obtained from a tissue and processed for medical use. They are not synthetic and are not fully defined in their composition and there is significant variation among the techniques used in their manufacture. The main differences result from sterilization, viral deactivation and chemical cross-linking that these materials are submitted. However, the common denominator is that all these prostheses attempt to avail themselves of the healing that occurs in association with the integration of biological material to the host tissue in varying degrees. Other reasons for the great attraction that the prostheses among surgeons are the results from complications of synthetic prostheses when used in contaminated sites or when juxtaposed with segments with intestinal fistula and risk of erosion.

It has been said that in addition to laparoscopic surgery, the latest news in the management of paraestomal hernias is the use of substitutes of biological meshes[20]. This is not exactly true. As discussed below, the experience of the authors with the repair of paraestomal hernias, the prosthesis of bovine pericardium was used in 13 patients for direct repair. Another mistaken assumption by some authors is that biological materials can cost thousands of dollars, which is certainly not the case with pericardial prostheses.

The evaluation of the success of the use of prostheses for the repair of these hernias is determined by the small number of cases reported in the literature. In the publication with the largest number of patients relapse occurred in 15% of patients after seven months[37]. Ellis published in 2010[11] the results in 20 patients with prosthesis using small intestinal submucosa (SIS - small intestinal submucosa) placed in the intraperitoneal position as proposed by Sugarbaker[36]. There were no postoperative infections and no prosthesis had to be removed. Observed recurrence in two (9%) patients after 18 months of follow-up.

There is evidence that the prostheses are effective for paraestomal hernia repair. Remains open, however, if they are superior to synthetic prostheses. Probably, if available, their use should be preferred in situations of contamination or no need for direct contact with the bowel.

Results of the authors of this paper

Between 1990 and 2005, 22 patients underwent surgical treatment of paraestomal hernias in Service of Colon and Rectal Surgery, Hospital das Clínicas, Faculty of Medicine, University of São Paulo, SP, Brazil (48). All patients had colostomies as a result of abdominoperineal amputation of the rectum. In 15 (68%) patients, hernia correction was made by direct repair using bovine pericardium mesh in 13 and in two none. In the other seven (32%) patients, was chosen the transposition. After 50 months of median follow-up, recurrence was found in three (13.6%) after 16 months of the operation.

Prevention

Despite the enormous problems and the significant lack of good quality scientific evidence about the management of paraestomal hernias, only recently the possibility of preventing them gained the attention of the medical community. Perhaps because it is more recent concern, the quality of evidence available is good and is represented by two randomized trials.

In 2004, Janes et al.[19] subjected the patients to be operated with the construction of definitive colostomy to randomization: with or without placement of a mesh in the subaponeurotic position (sublayer). Twenty-seven joined each group. After 28 months of follow-up, no cases of infection, fistula or pain occurred. Was used to mesh mixed polypropylene and absorbable material. After one year, recurrence was identified in 8/18 patients who underwent repair without mesh and 0/16 with the mesh. The same authors[18] reevaluated their results after five years. Twenty-one patients who underwent conventional colostomy were alive and 17 had paraestomal herniation. Among the 15 patients operated and available for evaluation, hernia was diagnosed in two.

The scientific evidence about the effectiveness of preventive subaponeurotic prosthesis placement in patients undergoing end colostomy came from the experience published by Serra-Aracil et al.[33]. These authors evaluated clinically, by computed tomography and blinding, 27 patients randomized to conventional end colostomy and 27 randomized subaponeurotic mesh colostomy. After 29 months of follow-up, clinical evaluation identified hernia in 11/27 (40.7%) patients undergoing conventional colostomy and 4/27 (14.8%) colostomy with mesh ($p = 0.03$). Tomography identified in 14/27 (44.4%) and 6/27 (22.2%) respectively, $p = 0.08$ the hernia presence.

Perhaps is a good idea to undertake prophylactic placement of the mesh if not all patients, at least in the ones with risk for paraestomal hernia undergoing definitive stoma, since this practice is safe and effective.

CONCLUSIONS

Despite the various techniques and media available to the surgeon to handle the paraestomal hernias, there is no ideal method that may be recommended for all cases. Thus, a careful analysis of risk factors can help the surgeon to choose the best treatment option that should be individualized to each case.

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