

# Parastomal hernia: incidence, prevention and treatment strategies

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## Abstract

Parastomal hernia continues to be a common and distressing problem for patients with stomas, and research investigating prevention strategies is scant. In March 2005 Thompson and Trainor reported that the introduction of a prevention programme for 1-year post-stoma surgery formation had significantly reduced the incidence of development of parastomal hernia. This was further supported by a follow-up study in 2007, strengthening the reliability and validity of the first findings by confirming a statistically significant reduction in the incidence of parastomal hernias through the introduction of a simple non-invasive prevention programme. This article reviews the current literature on incidence, prevention and treatment, together with a step-by-step guide for stoma care nurses to implement the prevention programme and/or study within their area.

**Key words:** Hernia ■ Parastomal ■ Stoma ■ Stomal complications

Parastomal hernia is a frequent difficulty for patients with stomas. This stomal complication affects patients' body image and self-confidence and occurs in approximately 20–50% of patients with stomas (Raymond and Abulafi, 2002; Williams, 2003).

When a stoma is formed, for whatever reason, a potential site of weakness is created within the abdominal muscle due to the surgical dissection of muscle to externalize the bowel. Rolstad and Boarini (1996) define a parastomal hernia as a bulging of peristomal skin indicating the passage of one or more loops of bowel through a fascial defect around the stoma and into the subcutaneous tissues (*Figure 1*). This presents problems for the patient both in terms of self-image – often producing a visible swelling in clothing – as well as practical appliance management difficulties.

## Incidence of parastomal hernia

Incidence may be higher than reported in the literature as limited studies are available. Of those that are available, incidence varies (*Table 1*).

Limitations of those studies explored include: use of small samples, inconsistencies in follow-up and timing of

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development of parastomal hernia. These factors ultimately hinder comparability.

A review of the literature revealed sparse research into prevention of parastomal hernia. One article that reviewed the literature related to prevention, treatment and incidence of parastomal hernia was uncovered (McGrath et al, 2006). The main conclusions from this article were that parastomal hernia carries significant morbidity for patients. Emergency surgery did not play a factor in the development; however age, obesity and previous surgery were implicated. Exercises to strengthen the abdominal muscles can be encouraged before surgery and mesh can be used at the time of surgery to minimize risk of parastomal hernia development.

Stoma care nurses play a vital role in educating patients as well as staff about ways that may help reduce the incidence of herniation.

## Contributing factors

Contributing factors to the incidence of a parastomal hernia differs from study to study, with some reporting factors such as obesity, gender, age, siting of stoma, abdominal distension and chronic cough (Pearl, 1989; McGrath et al, 2006). Bucknall et al (1982) found a statistically significant correlation between wound herniation and older people, males and obese

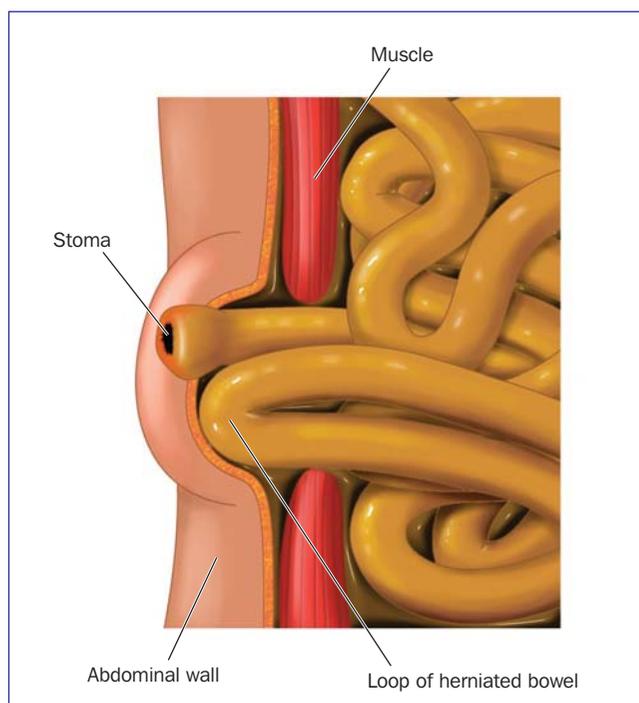


Figure 1. Peristomal hernia formation.

**Table 1. Reported incidence of parastomal hernia development**

Incidence of parastomal hernia	Studies
7%	Harris et al (2003)
16%	Lala et al (2002), Arumugam et al (2003)
20%	Pringle and Swan (2001)
28%	Thompson and Trainor (2005)
10–50%	Raymond and Abulafi (2002)

patients undergoing bowel surgery. Bucknall and Ellis (1984) supported this finding by reporting that chest infection, wound sepsis, male and aged 60+ were contributing factors. The correlation with age can be explained by the fact that with increasing age the rectus abdominus muscle becomes thinner and weaker and is thus hindered in providing adequate support for a stoma (Williams, 2003). Thompson and Trainor (2005, 2007) found statistically significant differences with age in both studies, reinforcing the findings of Bucknall et al (1982) and Bucknall and Ellis (1984).

Carne et al (2003) found that no technical factors relating to the construction of the stoma were shown to prevent stoma herniation, e.g. site of stoma formation, trephine size, fascial fixation and closure of lateral space. Thompson and Trainor (2005, 2007) also found no difference in incidence of parastomal hernia development when stomas were sited preoperatively. Yet, an earlier study by Sjudahl et al (1988) found that stomas constructed through the rectus abdominus muscle had a statistically significantly lower incidence than those constructed lateral to the rectus abdominus muscle, with incidences of 2.9%

and 21.6% respectively (Figure 2). A limitation to this study is the omission of length of time lapsed from surgery to follow-up. Martin and Foster (1996) would support this finding as they found that making an oversized opening for the stoma in the muscle and fascia at time of surgery as a possible cause of parastomal hernia (Kane et al, 2004). It is also important to point out that most stomas in recent years, whether constructed with or without siting, would in the majority, if not all cases, be constructed through the rectus abdominus muscle as this is now taken as common practice.

### Prevention

Thompson and Trainor (2005, 2007) investigated the use of a parastomal hernia prevention programme that used three components:

- Awareness of potential for development of parastomal hernia
- Abdominal exercises to strengthen the abdominal muscles
- Using abdominal support belts while undertaking heavy lifting and heavy work for 1 year postoperatively.

The findings demonstrated a statistically significant reduction in incidence of parastomal hernias following the introduction of a prevention programme. In year 1, 87 patients were recruited before the introduction of the programme, of which 28% of patients developed a parastomal hernia. In year 2 a further 114 patients were recruited, of which 14% developed parastomal hernias, and they had received education about the prevention programme. In year 3 a further 99 patients were recruited into the prevention programme and 17% developed parastomal hernias, however 7% of this group admitted to non-compliance with the programme.

These exercises were previously used by physiotherapists while teaching patients after major abdominal and gynaecological surgery, and can be recommended postoperatively or when the abdominal wound has healed, for all patients who have undergone stoma-forming surgery. In the study the exercises were taught from 3 months onwards (10 of each exercise daily for 1 year postoperatively). Compliance was inquired about at each review with the patients and documented in the nursing kardex. The findings suggested that the siting of stomas, type of surgery (emergency or elective) did not have any significance in the development of parastomal hernia.

Overall incidence of parastomal hernia in year 1 was 28% (24/87) which is similar to the reported incidence within the literature. In year 2, following the introduction of the programme, the incidence had dropped to 14% (16/114). Chi-squared – a test for independence evaluating statistically significant differences between proportions for two or more groups in a data set – demonstrated significance ( $P \leq 0.025$ ), suggesting that the introduction of the programme had a statistically significant effect in reducing the incidence of development of parastomal hernias.

When year 1 and year 3 were tested Chi-squared did not demonstrate statistical significance, which suggested unreliability of the results from the first study. However, on closer examination, in year 3 compliance had been inquired after from patients at each review appointment and seven of these patients reported they had not complied with the prevention programme. When these revised figures for those following the programme (10

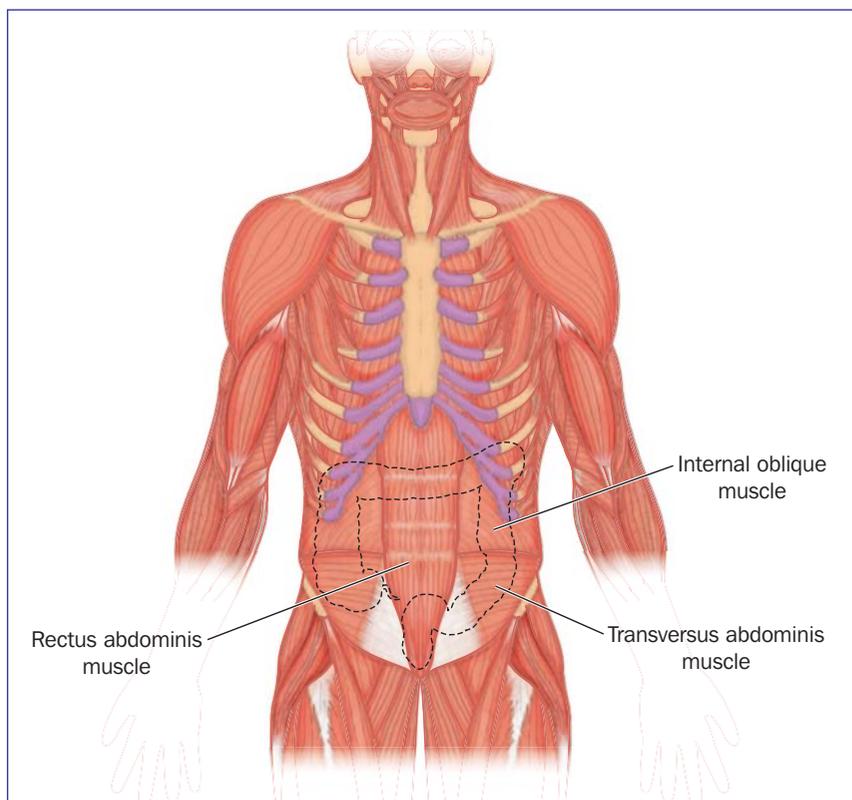


Figure 2. Musculature of the abdomen.

patients) were analysed using Chi-squared, statistical significance was found ( $P \leq 0.01$ ). This finding thus reinforces the use of this programme in the prevention of parastomal hernia, and would demonstrate reliability of the programme.

From these studies, general advice has been compiled for this article, which can assist stoma care nurses to help their patients to minimize the risk of development of parastomal hernia (see *Table 2* and *Figure 3*). If stoma care nurses wish to undertake the study within their area of work, guidance for this is given in *Table 3*.

## Treatment

Treatments for parastomal hernia can be conservative or surgical. When undertaking conservative treatment, reassurance for the patient (Blackley, 1998; Kane et al, 2004) is fundamental, as it can be frightening and distressing. Correctly fitting flexible appliances, such as those from ConvaTec, Coloplast, Dansac, Salts Healthcare, Welland Medical and Hollister, etc (Armstrong, 2001; Kane et al, 2004), allows them to mould to the peristomal skin, ensuring a secure and comfortable fit. Abdominal support belts or girdles, e.g. girdles and support belts by Respond Plus Ltd (County Antrim), Ostomy Support Belts by Salts Healthcare (Birmingham) and Corsinel Support Wear by Coloplast (Peterborough), can be recommended to provide comfort and support for the patient and caution should be stressed to the patient in relation to heavy lifting and heavy work (Kane et al, 2004; McCahon, 1999) to prevent or minimize further enlargement of the parastomal hernia. Abdominal supports should not have a hole cut in them so that support is evenly distributed over the whole abdomen. Patients should be encouraged to exercise their abdominal muscles to strengthen them; however, surgical permission should be sought before this if a hernia is already present. A body mass index range of 20–25 should be aimed for and regular exercise encouraged.

Surgical repair of parastomal hernia can be carried out locally but this has a high recurrence rate (Everingham, 1998; Baig et al, 2003). Relocation of the stoma, with or without using a synthetic mesh (Raymond and Abulafi, 2002), is another option and has a more favourable outcome. Several new repair methods have been investigated; Raymond and Abulafi (2002) used a split mesh technique on three patients and all remained recurrence-free between 18 and 24 months.

The repair of parastomal hernia is frequently found to be unsuccessful and often has complications. Stoma relocation is a method of choice for a first parastomal hernia. For recurrence, repair using prosthetic material appears to have the best outcomes (Rubin, 2004).

## Conclusion

Parastomal hernia presents significant morbidity for patients having undergone stoma-forming surgery and should be highlighted at preoperative consultations where and when possible, as its incidence presents significant risk for patients. Further research into prevention of parastomal hernia needs to be undertaken along with replication of the studies which have tried new methods of repairing parastomal hernia.

It is important to remember that surgical technique plays an important factor and will differ from centre to centre;

## Table 2. General advice to help minimize the risk of parastomal hernia development following surgery

Strong abdominal muscles are the premise for this prevention programme and any general exercise which uses these muscles is beneficial (e.g. swimming, walking and cycling). Please check with your surgeon or stoma care nurse before undertaking any exercise programme.

1. Avoid heavy lifting for 3 months post-surgery
2. Try to maintain good posture at all times
3. Carry out the exercises below from as early as discharge if the wound has completely healed
4. Use a support belt or girdle when undertaking heavy lifting or heavy working after 3 months and until at least 12 months postoperatively
5. Keep your weight within the body mass index 20–25
6. Support your stoma and abdomen whilst coughing in the first few months following surgery.

Adapted from: Thompson and Trainor (2007)

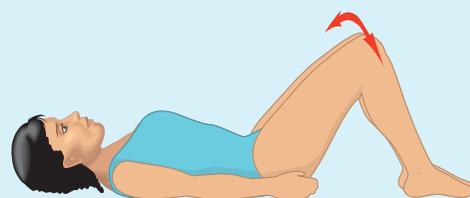
### Pelvic tilting

1. Lie on your back on a firm surface with knees bent and feet flat on the bed
2. Pull your tummy in, tilt your bottom upwards slightly while pressing the middle of your back into the bed and hold for two seconds
3. Let go slowly
4. Repeat ten times daily



### Knee rolling

1. Lie on your back on a firm surface with knees bent and feet flat on the bed
2. Pull your tummy in and, keeping your knees together, slowly roll them from side to side
3. Repeat ten times



### Abdominal sit ups

1. Lie on your back on a firm surface with knees bent and feet flat on the bed
2. Place your hands on the front of your thighs and pull your tummy in
3. Lift your head off the pillow
4. Hold for three seconds, then slowly return to starting position
5. Repeat ten times daily



Figure 3. Abdominal exercises following stoma-forming surgery (Thompson and Trainor, 2007).

**Table 3. How to undertake a prevention programme study**

The study focuses on prevention strategies for parastomal hernia and recommends patients undertake a prevention programme based on the premise of strong abdominal muscles reducing the risk of development. This involves advising about prevention of parastomal hernia, teaching abdominal exercises to be carried out for 1 year and advising the wearing of support garments for heavy work or heavy lifting in the first year after surgery. It is a combination of these treatment modalities that reduces incidence of parastomal hernia formation.

Steps to take to organize the study:

1. Seek ethical approval (if required) from your Trust
2. A retrospective study of patients operated on in your hospital over a 1-year period who need to have had their surgery at least 1 year ago or else you need to monitor them for 1 year. This is to look at the incidence of parastomal hernia development prior to the programme. Assessment can be carried out via computed topography, ultrasound or abdominal assessment.
3. Pick a start date and carry out for 1 year a prospective study using the prevention programme (see Table 1)
4. On discharge, advise patients of the importance to avoid heavy lifting stressing the consequences being the development of a parastomal hernia and advise of an optimal body mass index of 20–25. If necessary refer to the dietician for dietary advice
5. Teach (yourself or the physiotherapist) abdominal exercises outlined in the article from as early as discharge or when the wound is completely healed. Advise patients of the importance of NOT undertaking a full sit-up as this raises the intra-abdominal pressure too much and may cause a hernia – exercises need to be gentle.
6. Teach the importance of maintaining good posture
7. If patients will be undertaking heavy work or lifting after 3 months postoperatively, measure and fit for a support garment (any type) and instruct them to wear the garment while undertaking heavy work
8. Regularly review the patients in the prospective arm of the study for 1 year postoperatively, recording any incidence of parastomal hernia
9. Compare the results from both arms of the study
10. Test differences using Chi-squared to record if statistical significance is present.

It is important to remember that surgical technique plays a very important factor and will differ from centre to centre, but what should not differ is the per cent of reduction following the introduction of the programme from your retrospective arm and your prospective arm and this should reinforce the use of the programme in prevention of parastomal hernia.

this is clearly demonstrated by the literature on incidence of hernia. If centres do adopt a prevention programme, what should not differ is the per cent of reduction following the introduction of the programme from the retrospective arm and the prospective arm, and this should reinforce the use of the programme in prevention of parastomal hernia.

It is essential that prevention strategies are a significant aspect of a stoma care nurse's role to provide care and advice in prevention of parastomal hernias. BJN

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### KEY POINTS

- Parastomal hernia continues to carry significant morbidity for any patient who has undergone the formation of an abdominal stoma
- Prevention of parastomal hernia should be actively pursued with patients by stoma care nurses.
- Stoma care nurses play a pivotal role in educating and supporting patients in minimizing the risk of parastomal hernia development.
- Surgical technique plays a major factor in parastomal hernia development.
- Further research into management strategies for parastomal hernia repair is required.

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