

Incidence of parastomal hernia before and after a prevention programme

abstract

There has been scant research into the prevention of parastomal hernia formation following stoma surgery, which is a common and distressing event. This study shows that the introduction of a prevention programme for a period of one year post surgery significantly reduces the incidence of hernia development. The programme is simple and involves education, abdominal exercises and advice on the use of abdominal support garments. As such, this study should influence the practice of stoma care nurses around the UK.

Mary Jo Thompson RGN, BSc(Hons), PGDip Advanced Nursing MSc, is a stoma/coloproctology nurse specialist, Caraigavon Area Hospital Group Trust, Craigavon, Northern Ireland

Bernie Trainor RGN, BSc(Hons) Specialist Practice, is a stoma/coloproctology nurse specialist, Daisy Hill Hospital and Craigavon Area Hospital Group Trust, Northern Ireland

Parastomal hernia is a relatively common complication affecting 20-30 per cent of patients who have stomas (Williams 2003). When a stoma is formed there is the potential to create a site of weakness within the abdominal muscle. 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. This type of hernia can also be described as an incisional hernia that develops in the vicinity of a stoma (Pearl 1989).

In addition to practical appliance management difficulties, this weak spot can present problems for the patient in terms of self-image due to a visible swelling in clothing. Initially it may begin as a slight bulging, causing little or no discomfort, embarrassment or practical problems, but over time and if left untreated, it may become larger and problematic.

The reflective practice of two stoma care nurses at two centres in Northern Ireland revealed that stoma patients who exercised regularly and possessed strong abdominal muscles were less likely to develop a parastomal hernia. Armed with this knowledge it was decided to develop a programme emphasising and teaching about

the importance of strong abdominal muscles. The effectiveness of the programme in reducing the incidence of parastomal hernia was tested.

literature review

Incidence of parastomal hernias

Although a literature search uncovered several articles discussing the use of prosthetic/Marlex meshes as a method of repairing parastomal hernia (Raymond and Abulafi 2002; Reyahi *et al* 2003), little research has been done in the prevention of parastomal hernias. Documented incidence of such hernias varies considerably from the lowest incidence of 7 per cent (Harris *et al* 2003) to the highest of 10-50 per cent (Raymond and Abulafi 2002). As can be seen from these studies, the reported incidence of parastomal hernias varies considerably. In many cases, the study sample is small and the data are not comparable between trials as patient follow-up is not specified, leading to inconsistencies in the findings.

Follow-up of patients post-operatively

The issue of follow-up deserves closer attention. A literature search revealed that no studies are available which have examined the timing of parastomal hernia development. However, stud-

key words

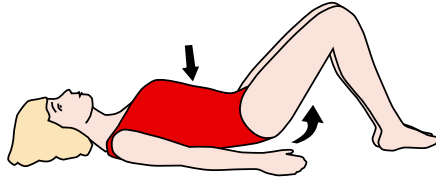
- Hernia
- Stoma care nurse
- Health promotion

These key words are based on the subject headings from the British Nursing Index. This article has been subject to double-blind review

Figure 1 Abdominal exercises following stoma forming surgery

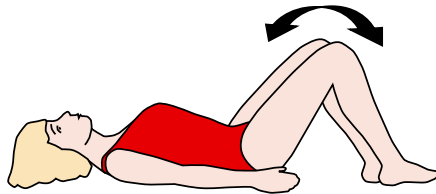
Pelvic tilting

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.



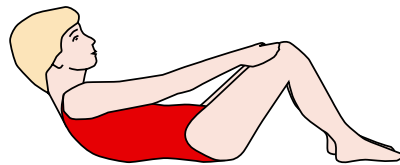
Knee rolling

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.



Reprinted with kind permission from Respond Plus

malnutrition, post-operative sepsis, abdominal distension and chronic cough (Pearl 1989). Other reviews suggest that chest infection, wound sepsis and the ageing process are also contributing factors (Bucknall and Ellis 1984). A significant correlation exists between wound herniation and elderly, obese males undergoing bowel surgery (Bucknall *et al* 1982).

The association with age may be explained by the fact that, with increasing age, the rectus abdominus muscle becomes thinner and weaker and is unable to provide adequate support for a stoma (Williams 2003). However, Williams also reports that females are more prone to weak rectus abdominus muscles implying a higher incidence of parastomal hernias in this group which contradicts the findings of Bucknall and Ellis (1984).

There appears to be no link between technical factors associated with the construction of a stoma such as siting, trephine size, fascial fixation and closure of lateral space, and stoma herniation (Carne *et al* 2003). Yet this contradicts an earlier study by Sjudahl *et al* (1988) which found that stomas constructed through the rectus abdominus muscle had a statistically significantly lower incidence of herniation than those constructed lateral to the rectus abdominus muscle with incidences of 2.9 and 21.6 per cent respectively. Other studies support this observation (Martin and Foster 1996).

aim of the study

The aim of this study was to ascertain if an increased awareness of the potential for parastomal hernia development, the introduction of abdominal exercises and the use of support belts from three months until one year post surgery minimised the development of a parastomal hernia.

method

The study was divided into two aims:

1. **Year 1** A retrospective study of patients who had a new stoma formed from August 2001 – July 2002 to examine for incidence of parastomal hernia development.
2. **Year 2** A prospective study of patients who had a new stoma formed from August 2002 – July 2003 for incidence of parastomal hernia

ies on the timing of development of incisional hernias are available; therefore, as a parastomal hernia can be equated with an incisional hernia (Pearl 1989), these studies were explored to ascertain the timing of hernia development.

A seminal study of 500 patients with incisional hernias showed that 67.8 per cent had developed by one year post surgery (Akman 1962). This finding has implications for the follow-up of stoma patients in the prevention of parastomal hernia, suggesting that patients should be followed for at least one year. In a separate study, abdominal incisional hernias developed before three months in 57 per cent of patients (Bucknall *et al* 1982).

Contributing factors

Contributing factors in the incidence of a parastomal hernia are reported as obesity,

development. These patients received active education on abdominal exercises (Figure 1) and were encouraged to wear support belts or girdles to minimise the risk of hernia development.

A technique of convenience sampling was used to capture all patients who underwent surgery for the formation of a stoma in the two centres involved. By using this method, the authors recruited the maximum number of patients during the proposed time scale. In year one (August 2001 – July 2002), 101 patients were recruited, however 14 patients died which resulted in an overall sample of 87 for year one. In year two (August 2002 – July 2003), 138 patients were recruited, but 24 of these patients died resulting in an overall sample for that year of 114. A total of 201 patients were recruited into the study.

The programme introduced in year two is outlined below:

- On discharge, patients were advised to avoid all heavy lifting for three months following surgery.
- At three months post-operatively:
 - (1) Patients were advised of the potential risk of the development of parastomal hernia
 - (2) Abdominal exercises (Figure 1) were taught and demonstrated to patients who were advised to undertake these exercises daily until one-year post-operatively
 - (3) All patients were measured and support belts or girdles were ordered; girdles were used by females and support belts by males. Patients were encouraged to wear these while lifting heavy objects or undertaking heavy work.

Patients were monitored at regular intervals for one-year post surgery (three months, six months and one year). The above advice was re-enforced at each clinic appointment.

results and discussion

Over the two-year period, 201 patients were recruited into the study. The age distribution of these patients is shown in Figure 2. The modal age group for Year 1 and Year 2 was the 61-80 age group whereby $n=51$ and $n=59$ respectively.

The overall incidence of parastomal hernia in Year 1 was 28 per cent ($n=24$) which is similar to the reported incidence in the literature, (Pringle

Figure 2 Age distribution for the complete sample over the two-year period

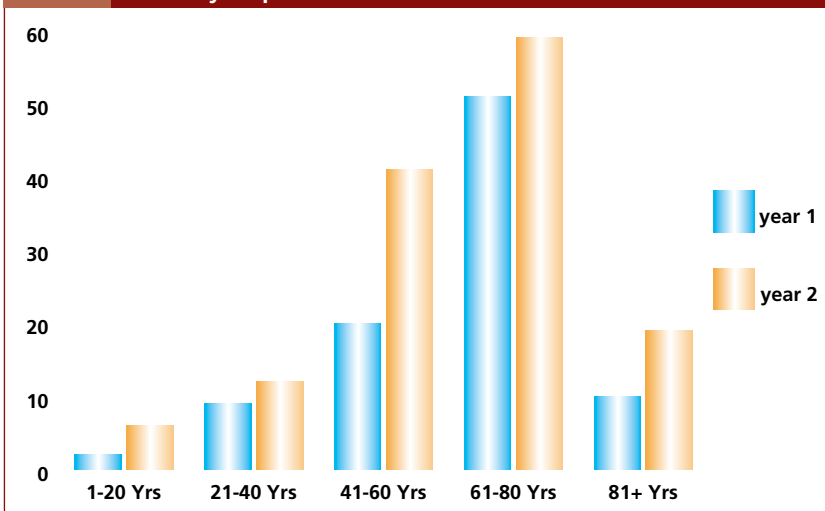


Figure 3 Incidence of parastomal hernia in Year 1 (August 1 – July 2)

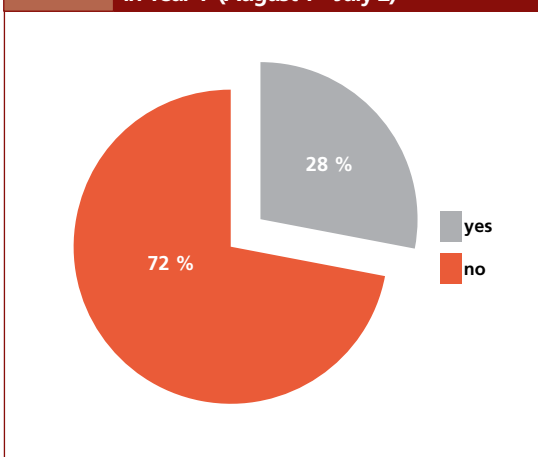
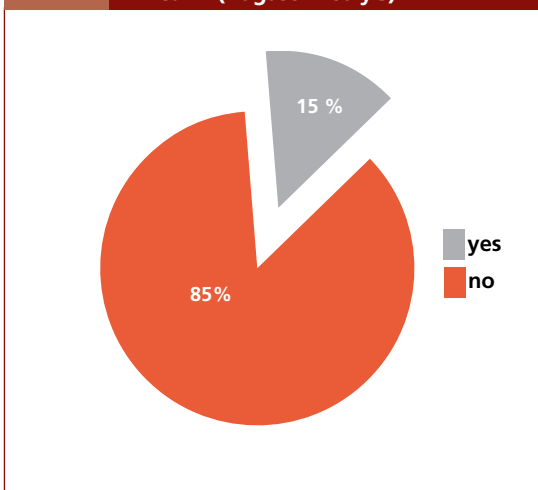


Figure 4 Incidence of parastomal hernia in Year 2 (August 2 – July 3)



and Swan 2001; Raymond and Abulafi 2002) (Figure 3). In Year 2, following the introduction of the programme, the incidence of parastomal hernias development dropped to 14 per cent (n=16) (Figure 4). A Chi square significance test revealed a p value of $p \leq 0.025$ indicating that the introduction of the programme had a statistically significant effect in reducing the incidence of parastomal hernia development.

In Year 1, 65 per cent of patients had their stomas sited pre-operatively and emergency surgery was carried out in 39 per cent. When the emergency surgery patients were analysed it was noted that 11 of these patients developed a parastomal hernia representing an incidence of 33 per cent. Those who had elective surgery

and developed a parastomal hernia represented an incidence of 24 per cent.

In Year 2, the same percentage of patients had their stomas sited pre-operatively (65 per cent) and the percentage underwent emergency surgery (39 per cent). When the emergency surgery patients who developed parastomal hernias in Year 2 were analysed, it was shown that six of these developed a parastomal hernia representing an incidence of 15 per cent. Those who had elective surgery and developed a parastomal hernia represented an incidence of 13 per cent. These figures are almost halved from Year 1 for emergency and elective surgery following the introduction of the programme. This suggests that whether the surgery was elective or an emergency there was no difference in terms of the incidence of parastomal hernia development.

The significance of these findings is the reduced number of patients with parastomal hernias who had undergone emergency surgery (a drop of 33 per cent in Year 1 to 15 per cent in Year 2). This suggests that the introduction of the programme did make a difference to the overall incidence of hernia development. These findings also suggest that the siting of stomas has no effect on the development of parastomal hernia, an observation supported by Carne *et al* (2003).

When the distribution for incidence of parastomal hernia was analysed according to stoma type, we can see that in Year 1, 12 of the 24 patients had a sigmoid colostomy, one had transverse colostomy, nine had an ileostomy and two had a urostomy. In Year 2 (n=16), nine patients had a colostomy, six ileostomy and one urostomy.

Although patients with colostomies from a prima-facia point of view appeared to be more prone to the development of parastomal hernias (Figure 5), Chi-square analysis did not demonstrate statistical significance ($p=0.06$), suggesting that the type of stoma was irrelevant and that each carried an equal risk of parastomal hernia development. Nevertheless, subtle trends can be seen suggesting that patients with colostomies are more prone to hernia development. This is supported by that of Carne *et al* (2003) who found that parastomal hernia affects 1.8 - 28.3 per cent

Figure 5 Comparison of distribution of parastomal hernia according to stoma type

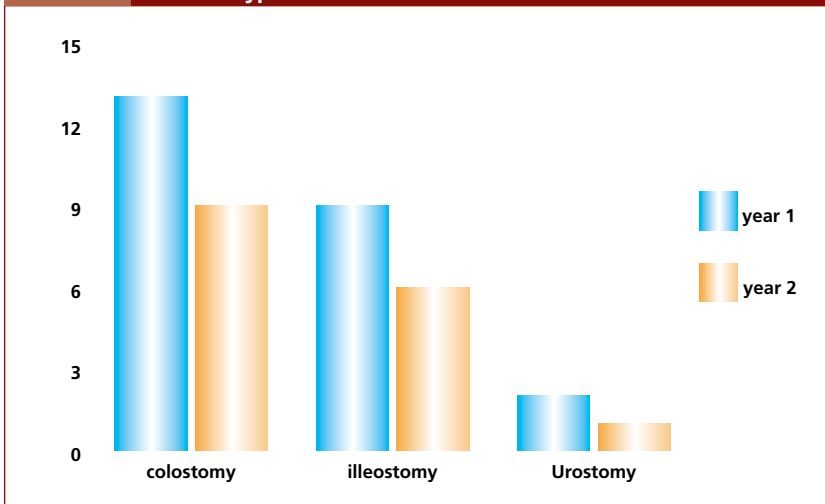
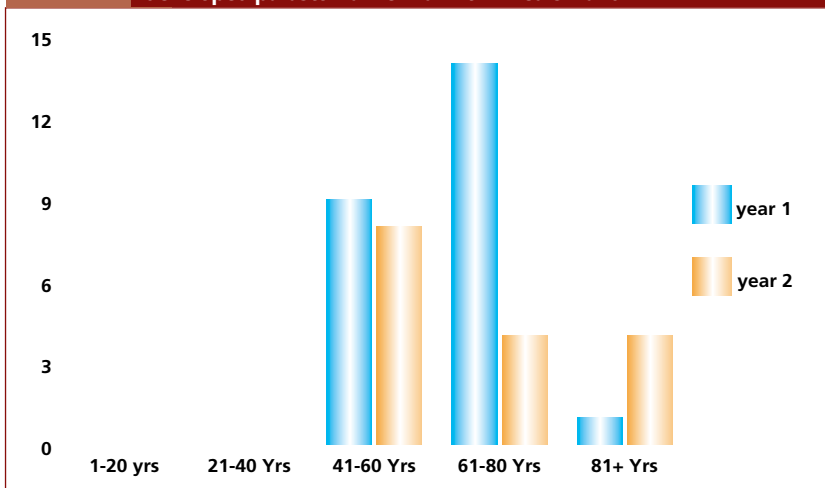


Figure 6 Comparison of age distribution amongst patients who developed parastomal hernia within Years 1 and 2



of end ileostomies compared with 4-48.1 per cent of end colostomies.

When the age of patients who developed parastomal hernias was analysed, it was interesting to note that none of the patients aged 40 years or below developed a hernia (Figure 6). A possible explanation for this could be better compliance with the programme, or more active lifestyles. The modal (most frequent) group of patients who developed a hernia in Year 1 were aged 61-80 years; whereas in Year 2, the modal group changed to the 41-60 age group. This difference is statistically significant ($p < 0.05$). A possible explanation for this is the large number of patients aged 61-80 years who developed a parastomal hernia in year one ($n=14$) and a considerable drop in the number of patients with a parastomal hernia in this age group in Year 2 ($n=4$). Stoma care nurses may be advised to target these patients with better education and re-enforcement of the programme.

timing of hernia development

The timing of hernia development was only examined in the prospective arm of the study. The retrospective arm was examined, but little documentation was found on the timing of incidence of parastomal hernia, and efforts

to quantify this were abandoned. The results for Year 2 show that 56 per cent of patients developed their parastomal hernia within six months of surgery. This finding supports the use of abdominal support garments early after discharge from hospital.

It should be noted that non-compliance to the exercise and body support programme may have influenced results and is a factor that was not examined in this study. Moreover, this is a preliminary report, and follow-up needs to continue to examine the timing of incidence of parastomal hernias.

conclusion

This is the first UK study to show a statistically significant reduction in the incidence of parastomal hernias through the introduction of a non-invasive prevention programme. As such, this study has the potential to significantly impact in the way stoma care nurses provide care and advice in prevention of parastomal hernias. The programme is feasible for all ages of patient and should be recommended for all patients for at least one year post stoma surgery. Follow-up of these patients will continue at six-monthly intervals to monitor any additional incidence of parastomal hernia development ■

References

- Akman P (1962) A study of five hundred incisional hernias. *Journal of the International College of Surgeons*. 37, 125-142. In Bucknall T, Ellis H (1984) *Wound Healing for Surgeons*. East Sussex. Bailliere Tindall
- Arumugam P *et al* (2003) A prospective audit of stomas - analysis of risk factors and complications and their management. *Colorectal Disease*. 5, 1, 49-52
- Bucknall T *et al* (1984) *Wound Healing for Surgeons*. East Sussex. Bailliere Tindall
- Bucknall T *et al* (1982) Burst abdomen and incisional hernia: a prospective study of 1129 major laparotomies. *British Medical Journal*. 284, 931-933
- Carne P *et al* (2003) Parastomal hernia. *British Journal of Surgery*. 90, 7, 784-93
- Harris D *et al* (2003) Analysis of Stomas and their complications in a ten-year period in a district hospital. *Colorectal Disease*. Supplement. 5, 69
- Martin L (1996) Parastomal hernias. *Annals of Royal College of Surgeons England*. 78, 81-84
- Pearl R (1989) Parastomal hernias. *World Journal of Surgery*. 13, 569-572
- Pringle W, Swan E (2001) Stoma Care Supplement. Continuing care after discharge from hospital for stoma patients *British Journal of Nursing*. 10, 19, 1275-1280
- Raymond T, Abulafi A (2002) Parastomal hernia repair - a novel approach. *Colorectal Disease*. Supplement 1. 4, 64
- Rolstad B, Boarini N (1996) Principles and techniques in the use of convexity. *Ostomy and Wound Management*. 42, 1, 24-32
- Reyahi A *et al* (2003) Formation of an end stoma: A grid iron approach is associated with a low complication rate. *Colorectal Disease* 5. Supplement 1. 69
- Sjodahl R *et al* (1988) Parastomal hernia in relation to site of the abdominal wall. *British Journal of Surgery* 75: 339-341
- Williams J (2003) Parastomal hernia. Journal No. 181. Autumn. 14-16