Prevention of parastomal hernia: a comparison of results 3 years on

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 following stoma formation surgery significantly reduced the incidence of parastomal hernia. This follow-up study strengthens the reliability and validity of the findings of the first study by confirming a statistically significant reduction in the incidence of parastomal hernias through the introduction of a simple non-invasive prevention programme.

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Key words

- Parastomal Hernia
- Stoma care nurse
- Stoma
- Prevention strategies

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Parastomal hernia remains a common complication of stoma surgery, occurring in 10–50% of patients (Raymond and Abulafi, 2002; Williams, 2003). Rolstad and Boarini (1996) define a parastomal hernia as a bulging of parastomal skin, indicating the passage of one or more loops of bowel through a fascial defect around the stoma and into the subcutaneous tissues. A potential area of weakness within the abdominal muscle is created when a stoma is formed, and this can present problems for the patient in terms of self-image and difficulty in managing the practical appliances .

Literature review

A literature review undertaken for the initial study (Thompson and Trainor, 2005) revealed that there had been little research into the prevention of parastomal hernias. A second review of the literature carried out 3 years on for the follow-up study found there had been no further research specifically on prevention of parastomal herniation; however, one review of the information available on incidence, treatment and prevention of parastomal hernias was uncovered (McGrath et al, 2006).

McGrath et al (2006) found that the incidence of parastomal hernia varied according to the type of stoma formed. Reported rates of development of parastomal hernia in the literature varied widely: Harris et al (2003) reported the lowest incidence at 7% (n=354); Lala et al (2002) and Arumugam et al (2003) both reported rates of 16% (n=55 and n=97, respectively); and Pringle and Swan (2001) reported a rate of 20% (n=112). Raymond and Abulafi (2002) reported an incidence of 10–50%. Limitations of these

studies included small samples and inconsistencies in follow-up and documentation of the time of development of parastomal hernia, all of which hinder comparison of results.

Follow-up of stoma patients postoperatively is poorly documented with regard to the time of development of parastomal hernias. Akman (1962) reported that 67.8% of incisional hernias (n=500) had developed within 1 year postoperatively. Bucknall et al (1982) found that 57% of abdominal incisional hernias (n=84) had developed within 3 months surgery.

Factors contributing to the development of parastomal hernia reported in the literature are obesity, sex, age, site of the stoma, abdominal distension and chronic cough (Pearl, 1989; McGrath et al, 2006). The variables examined in this study differ. Bucknall and Ellis (1984) reported the contributing factors to be chest infection, wound sepsis, male sex and age 60+ years. Bucknall et al (1982) found a statistically significant correlation between wound herniation and the elderly, male sex and obese patients undergoing bowel surgery.

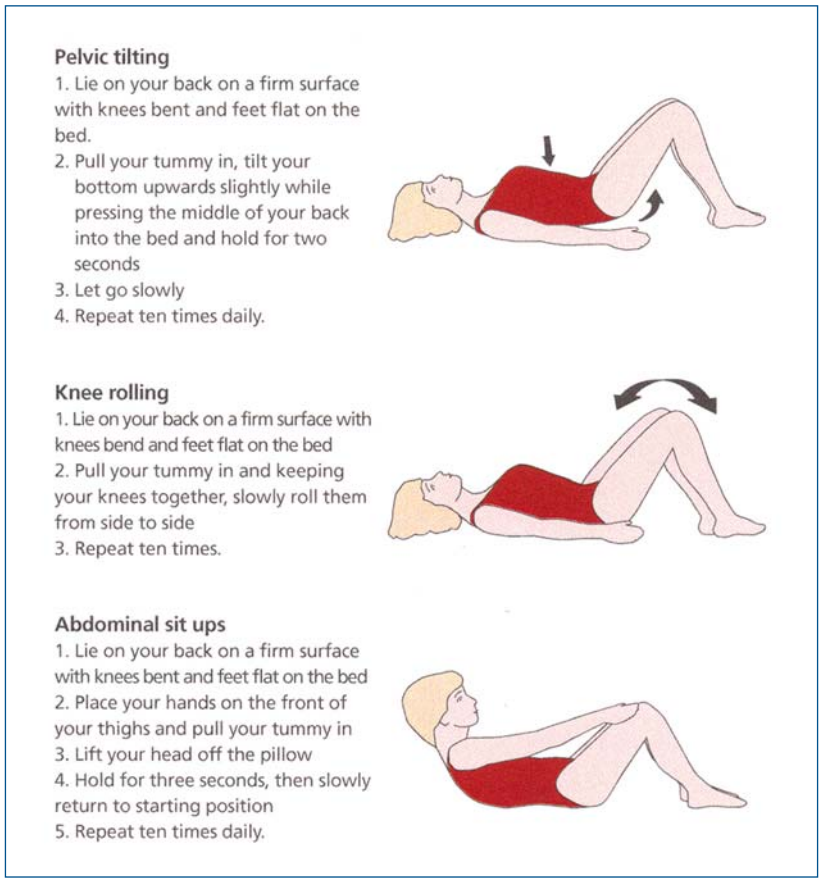


Figure 1. Abdominal exercises following stoma-forming surgery. (Reprinted with kind permission from Respond Plus)

Aim of the study

The aim of this follow-up study was to ascertain the reliability of the prevention programme carried out by Thompson and Trainor (2005). Raised awareness of the potential for parastomal hernia development, the introduction and teaching of abdominal exercises and advice to use support belts while undertaking heavy lifting or heavy work until 1 year post-surgery were assessed to ascertain their continued effectiveness in minimizing the development of parastomal hernia.

Method

The follow-up analysis utilized year 1 data as the control for comparison of the effectiveness of the programme as it was in the initial study (March 2005):

Year 1: A retrospective study of patients who had a new stoma formed between August 2001 and July 2002 to determine the incidence of parastomal hernia formation.

Year 2: A prospective study of patients who had a new stoma formed between August 2002 and July 2003 to determine the incidence of parastomal hernia formation. These patients received active education on abdominal exercises (*Figure 1*) and were encouraged to use support belts or girdles to minimize the risk of developing a parastomal hernia.

Year 3: A prospective study of patients who had a new stoma formed between August 2003 and July 2004 to determine the incidence of parastomal hernia formation. These patients received active education on abdominal exercises (*Figure 1*) and were encouraged to use support belts or girdles to minimize the risk of developing a parastomal hernia. This arm of the study was utilized to test the reliability of the results obtained in year 2. Follow-up was carried out for one year post-surgery.

As in the initial study, convenience sampling was used to facilitate the capture of all patients who underwent surgery for stoma formation at the two centres involved in the study. This method of sampling enabled the maximum number of patients possible to be recruited during the proposed timescale. Within year 1 (August 2001 to July

2002) 101 patients were recruited, of whom 14 died, resulting in an overall sample of 87 for this year. Within year 2 (August 2002 to July 2003) 138 patients were recruited, of whom 24 died, resulting in an overall sample of 114 for this year. Within year 3 (August 2003 to July 2004) 148 patients were recruited, of whom 49 died within the 1-year follow-up and were therefore excluded, resulting in an overall sample of 99.

The prevention programme introduced in year 2 continued to be used in year 3 and is outlined below:

1. On discharge, patients were advised to avoid all heavy lifting for 3 months following surgery.
2. At 3 months postoperatively:
   i. Patients were advised of the potential risk of the development of parastomal hernia.
   ii. Abdominal exercises were taught and demonstrated to patients (*Figure 1*). Patients were advised to undertake these exercises daily until 1 year postoperatively.
   iii. Patients were measured and support belts or girdles were ordered. Patients were instructed and encouraged to wear these while lifting anything heavy or undertaking heavy work.
3. Patients were monitored for the incidence of parastomal hernia for 1 year postoperatively at regular intervals (3, 6 and 12 months). The above advice was reinforced at each clinic appointment.

Results and discussion

A total of 387 patients were recruited to the study over the 3-year period; 87 of these died, leaving 300 patients involved in the study. The age distribution of these patients is shown in *Figure 2*. It can be seen that the modal age group for years 1, 2 and 3 is 61–80 years (n=51, 59 and 53, respectively).

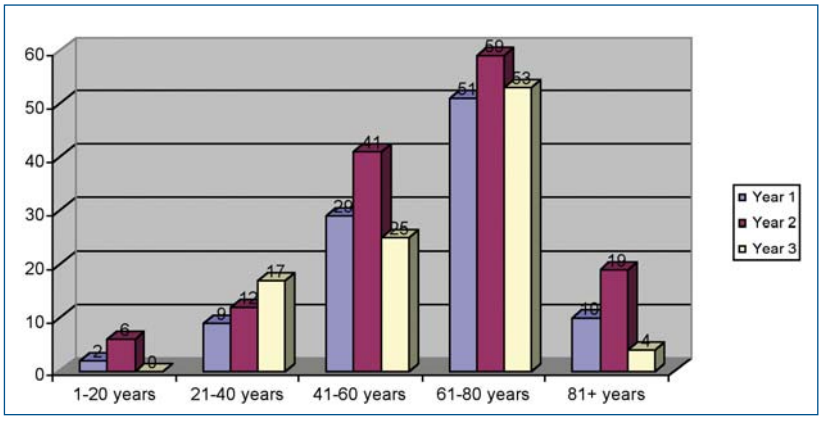


Figure 2. Age distribution of study participants over the 3-year period.

The incidence of parastomal hernia in year 1 was 28% (n=24) (*Figure 3*). This is similar to the rates reported in some of the previous studies, e.g. 20% (Pringle and Swan, 2001) and 10–50% (Raymond and Abulafi, 2002).

In year 2, following the introduction of the prevention programme, the incidence of parastomal hernia dropped to 14% (n=16), rising to 17% (n=17) in year 3 at 12 months postoperatively (*Figure 3*).

Analysis of the results using chi-squared ($P \leq 0.025$) showed a significant difference between year 1 results and year 2 results, but no significant difference between year 1 and year 3 results, which suggested unreliability of the findings. However, year 3 patients had been asked about compliance with the programme at each review appointment, and closer examination of the results revealed that seven of the patients reported not having undertaken the exercise programme or using support garments for heavy lifting/heavy work as instructed. When the revised figures for those following the programme (n=10) were analysed using chi-squared, a statistically significant difference between years 1 and 3 was found ($P \leq 0.01$). This finding thus reinforces the effectiveness of this programme in preventing parastomal hernia, and demonstrates reliability of the programme.

Second stage follow-up in May 2005

In May 2005, all the patients involved in years 1 and 2 of the study were reviewed again to find out whether any further patients had developed parastomal hernia.

Year 1: The incidence of parastomal hernia was 49% (n=75 patients; 26 deaths). The mean time from surgery was 41 months.

Year 2: The incidence of parastomal hernia was 30% (n=91; 47 deaths). The mean time from surgery was 29 months.

When these figures were analysed using chi-squared, the difference between the years was statistically significant. It is important to note that, because of the deaths, a longitudinal follow-up of patients can potentially skew results, so these figures need to be interpreted with that in mind.

Stoma type

Analysis of stoma type in year 3 patients showed that there were more patients with colostomies (n=51) than with ileostomies (n=43) or urostomies (n=5).

In the initial study, when the distribution of parastomal hernia was analysed according to stoma type, the differences were not statistical significant. This suggested that, irrespective of the type of stoma, all stoma patients had an equal risk of developing a parastomal hernia. However, when the figures for year 3 in the present study were analysed, it was found that 13 of 17 colostomy patients had developed a parastomal hernia compared with only 4 of 17 ileostomy patients; chi-squared analysis showed these differences to be statistically significant ($P \leq 0.01$), indicating that there was a correlation between stoma type and incidence of herniation. Data from the initial study were therefore revisited and chi-squared tests were carried out individually for each year. This time statistically significant differences were found for each of the 3 years, reinforcing the suggestion that patients with colostomies are more likely to develop a parastomal hernia than patients with ileostomies and urostomies (*Figure 4*). These results support those of McGrath et al (2006) who, while reviewing the literature on risk factors for parastomal herniation, found that the incidence of parastomal hernia varied with the type of stoma formed.

When the distribution of parastomal hernias in years 1, 2 and 3 was analysed according to age of the patients it was found that none of the patients aged 40 years or less developed a parastomal hernia (*Figure 5*). A possible reason for this may be that younger patients show better compliance with the programme or have more active lifestyles.

The literature could be seen to support this finding, e.g. Bucknall and Ellis (1984) reported that age 60+ was a contributing factor in the development of parastomal hernia. It was noted that the modal age group for patients who developed a parastomal hernia was 61–80 years in year 1 and 41–60 years in year 2; however, in year 3 it changed back to the 61–80 years. When these results were tested for significance using the chi-squared test, a value of $P \leq 0.05$ was obtained, indicating that the differences were statistically significant. On closer examination of the data, it was noted that all of the patients in age group 61–80 who had developed a parastomal hernia had a colostomy.

Figure 3. Incidence of parastomal hernia in years 1, 2 and 3 (Yes = parastomal hernia present; No = no herniation).

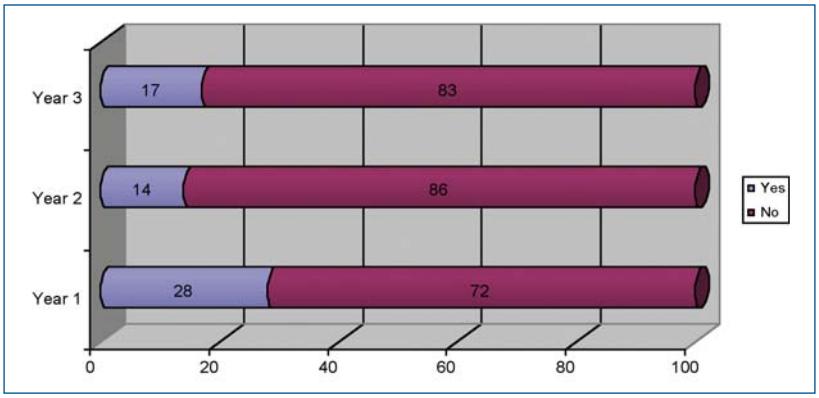
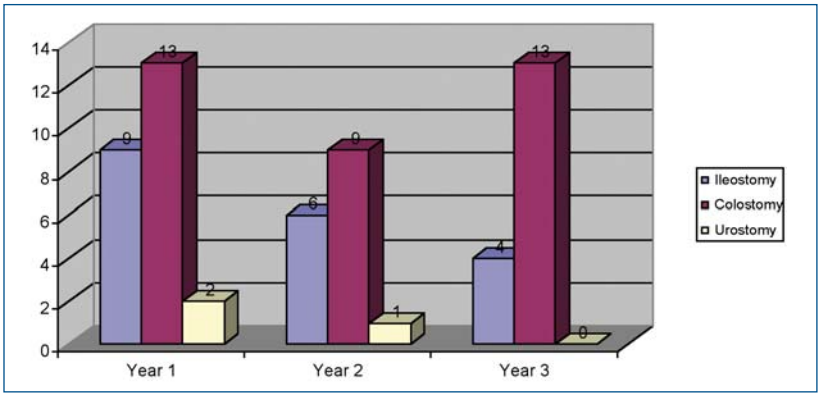


Figure 4. Distribution of parastomal hernia according to stoma type in years 1, 2 and 3.

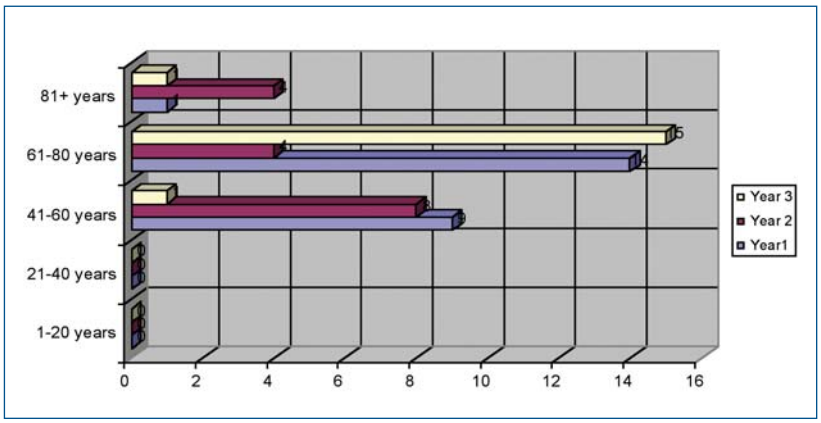


Time of development of parastomal hernia

The time of development of parastomal hernia was examined only in the prospective arms of the study (years 2 and 3). The retrospective arm of the study (year 1) was not examined because of poor documentation of the time of development of parastomal hernia. In year 2, 56% of patients developed a parastomal hernia within 6 months of surgery; in year 3 the timing was almost identical to that in year 2, which again suggests reliability of the results. In years 2 and 3, 58% of patients developed their hernia within 6 months of surgery, which again is supported by the literature.

These results are comparable to those of Bucknall et al (1982), who showed that 57% of abdominal incisional hernias (n=84) had developed before 3 months postoperatively, and reinforce the need to endorse the use of abdominal exercises and support garments for

Figure 5. Distribution of parastomal hernia according to age in years 1, 2 and 3.



heavy lifting from as early as discharge from hospital instead of 3 months postoperatively.

Limitations

The study has limited generalizability because it was a relatively small sample. In years 1 and 2 we suspected that patients' non-compliance with the programme may have affected the results. In year 3 we proved this to be correct, by inquiring about and recording non-compliance with the prevention programme. When the non-compliant patients were excluded from chi-squared analysis, the programme was proven to be statistically significant in reducing the incidence of parastomal hernia.

We used convenience sampling to capture all patients within the timeframe of the study, in an attempt to ensure that our sample was representative of patients treated within our catchment area.

Recommendations

A longitudinal follow-up of the patients involved in the study of at least 5 years should be undertaken to ascertain whether length of time with a stoma affects the incidence of parastomal hernia. However, it should be borne in mind that the results can be skewed by the death of some of the patients, as highlighted in the second stage follow-up, making it difficult to obtain a true picture. Perhaps follow-up for incidence of parastomal hernia needs to be carried out according to diagnosis in order to truly understand the implications of parastomal hernia development to patients. An example is if patients are offered a stoma for quality-of-life issues, the risk of development of parastomal hernia may need to be provided for the patient to truly make an informed choice whether to proceed with surgery.

The study needs to be repeated with larger patient numbers in other centres and in other countries. Nevertheless, the year 3 results have further reinforced the validity and reliability of this study.

Conclusion

This study continues to have a significant impact on the way that stoma care nurses provide care and advice on prevention of parastomal hernias. It remains the first UK study to have shown a statistically significant reduction in the incidence of parastomal hernias through the introduction of a non-invasive prevention programme. The programme is within the reach of all ages of patients and should be recommended for all patients for at least 1 year following surgery for the formation of a stoma. ■

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