Parastomal hernias revisited: a cost-effectiveness analysis
Is an ounce of prevention really worth a pound of cure?

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Why...revisited?

Thompson J and Jack L 1994 Parastomal Hernias

Concluded with some unanswered questions about parastomal hernias:

1. What is the incidence?
2. Are there any other measures a surgeon may take?
3. Should stomal therapists be encouraging more people to wear support binders/corsets as a preventative measure?
4. Should corsets have a hole for the appliance?
5. Are there any other conservative measures available?
Definition

...’tissue structure and function are lost at the load-bearing muscle, tendon and fascial level’ (Franz, 2008)
Incidence

Data vary – non-standardization

Carne et al (2003) meta-analysis concluded:

- 4.0 - 48.1% end colostomies
- 0 - 30.8% loop colostomy
- 1.8 - 28.3 % end ileostomies
- 0 - 6.2% loop ileostomies

A review of 16,470 on the American United Ostomy Association Register revealed 30% incidence over all types of stomas (cited in Gray et al, 2005).
Subtypes (Devlin, 1983)

Classification helps describe hernias seen on CT scans.

4. DEVELOPMENT OF SUBCUTANEOUS HERIA

- Intra-abdominal pressure related to:
  - Obesity
  - Coughing
  - Sneezing
  - Constipation
  - Angina
  - Prostatism

Opening in abdominal layer through which bowel is exteriorized to make stoma. If opening too big, muscles too weak or intra-abdominal pressure too great a hernia may develop.

5. INTRASTOMAL HERIA

- Loop of bowel or omentum in hernia sac under subcutaneous fat layer.

In a spout ileostomy a loop of bowel may herniate up beside the ileum and be trapped beneath the everted layers of stoma. This has potential to prolapse if too much pressure.

6. INTERSTITIAL HERIA

Loop of bowel or omentum trapped between abdominal layers.
There is gross small bowel obstruction due to a parastomal hernia (large arrow). Note the presence of gas within the proximal bowel wall (curved arrows) and portal vein (small arrow) in b.
Diagnosis

- Clinical examination – digital + Valsalva
  - upright and supine
- Careful history – asymptomatic swelling
  - mild discomfort, dull ache/dragging
  - nausea
  - gradual enlargement hernia and stoma aperture
  - difficulty with appliances
  - anxiety, distress,
    psychological problems
- CT or x ray with oral contrast
Possible complications

- Intermittent obstruction
- Skin ulceration and infection
- Incarceration
- Strangulation
- Perforated bowel
- Ineffective irrigation
- Back pain
- Exacerbation of respiratory problems
Risk factors

**Intrinsic**
- Abnormal collagen metabolism
  - genetic
  - acquired
- Age
- Wound breakdown
- Obesity
- Smoking
- Raised intra-abdominal pressure (chronic constipation, COAD, prostatism, ascites)
- Mechanical strain e.g. weight lifting

**Extrinsic**
- Previous hernia repair
- Emergency surgery?
- Location of stoma?
- Trephine size?
- Fascial fixation?
- Closure lateral space?
- Intra or extraperitoneal?
- Stoma siting by STN?
Management

Best treatment = remove the stoma
... risk of incisional hernia in old stoma site!

Commonest – conservative (support device)

Surgery – avoided due to high recurrence rate

Indications – obstruction, strangulation, leakages +++

Relative indications – recurrent pain, cosmesis
Nursing management?
(Gray et al 2005 review of literature)

- No proper studies – expert opinion and clinical experience
- Modify appliance
- Education about what to do if incarceration / strangulation
- Regular visits for monitoring
- If problems with irrigation – stop performing procedure
- Education about how to maintain soft stool with diet / fluids
- Application of hernia support belts
- Education that hernia must be reduced when support applied
- Support belts custom fit – hole or no hole? Contentious issue
Surgical options

- Local tissue repair
- Stoma relocation
- Repair with mesh – intraperitoneal
  - preperitoneal
  - fascial overlay mesh repair
- Laparoscopic repair

Results generally poor – recurrences++
Surgical prevention

1 study cited in Israelsson, 2008

“large pore mesh with reduced polypropylene and high proportion of absorbable material placed in sublay position at primary operation”

Other surgeons have their little “tricks” e.g. purse string sutures around stoma
Thompson & Trainor, 2005

Compared 2 groups for incidence of hernia development

Retrospective – without treatment

Prospective – with:
Discharge instructions not to lift heavy objects for 3 months
At 3 months instructed re abdominal exercises and encouraged to wear support belts when lifting

Incidence Group 1: 33%
Group 2: 15%
Support belts
Hole or no hole?

DIRECTIONS OF FORCES WHEN SUPPORT BELT/GARMENT HAS HOLE FOR BAG

The hole has to be much bigger than the diameter of the stoma because it must accommodate the area of base plate or bag adherent to the skin around the stoma, plus a little more to allow bag to slip the through hole. This replicates what caused or contributed to hernia formation.

Support belt and hole does not stop hernia (but may give some comfort)
Hole or no hole? (2)

8. **RISK OF PROLAPSE**

- Intra-abdominal pressure is outwards
- Support belt presses inwards
- Tight belt may even cause prolapse.

9. **DIRECTIONS OF FORCES**
   WHEN SUPPORT BELT/GARMENT HAS NO HOLE CUT FOR THE BAG

- If support belt/garment is impeding filling of bag then adjust belt/garment so it is NOT SO TIGHT.
- You are aiming to give support not to constrict.

- Tight belt/garment with hole has caused stoma/hernia prolapse and prolapsed bowel is at risk of trauma, pressure necrosis and is unsightly.
Belt with a hole:
Pressure behind hernia focussed at the hole forcing hernia/stoma outward.

Full support belt:
Covers stoma/hernia completely and balances inward and outward pressure. Flexible material and proper adjustment allows the stoma to function normally under full support.
Cost-effectiveness analysis
(outcomes can be left in natural units)

Costs of *having* a parastomal hernia
Psychological – embarrassment / worry
Social – withdrawal / lost opportunities
Economic – new clothes / laundry / new appliances / time off work to see STN
Physical – discomfort / pulling / dragging
back pain / exacerbation respiratory problems /
intermittent obstruction / strangulation / perforation
**Cost of appliances**

Extra appliances needed due to changes in size, shape, location of stoma and surrounding contours and also due to leakages.

Aust Govt Dept Health and Ageing (Feb 2008) Pricing Guidelines Stoma Appliance Scheme Consultation Paper

<table>
<thead>
<tr>
<th>Simplest appliances</th>
<th>1 piece closed</th>
<th>$2.31 → $3.45</th>
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<tbody>
<tr>
<td></td>
<td>drainable</td>
<td>$5.1 → $7.95</td>
</tr>
<tr>
<td></td>
<td>urostomy</td>
<td>$3.92 → $9.04</td>
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</table>

Accessories (Stoma Appliance Scheme Schedule Jan 2009)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>Belt</td>
<td>$5.57</td>
</tr>
<tr>
<td>Paste / tube</td>
<td>$10.72</td>
</tr>
<tr>
<td>Seals (each)</td>
<td>$4.22</td>
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<tr>
<td>Barrier wipes (each)</td>
<td>$1.00</td>
</tr>
<tr>
<td>Tapes</td>
<td>$1.10 → $12 per roll depending on width</td>
</tr>
<tr>
<td>Frames</td>
<td>$1.36 each</td>
</tr>
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</table>
Cost-effectiveness analysis
Prevention Program

Costs (SAS Lists Jan 2009)
Support pants $341.97pa
Belts $126.64 → $202.32pa
Visits to STN X 3-4 pa
Patient time (off work) $?
STN time $200
Patient time to perform exercises daily

Benefits
Thompson & Trainor (2005) showed drop in hernia devt from 33% to 15%
Stop smoking, regular exercises, avoid lifting, – general health benefit
Feel more comfortable when wearing the garments
Cost-effectiveness analysis

Surgical repair

Costs – Financial vary greatly according to surgeon and hospital
(Nov 2008 Australian Private Hospital Procedure Banding List)

Simple repair – surgeon $481.55 + assistant $48.15 (ie 10%)
Complex repair – surgeon $845.30 + assistant $84.53
Refashioning stoma – surgeon $540 + assistant $54.90

Anaesthetic depends on length of procedure, complexity of anaesthetic and age of patient eg for person <70 yrs 2 hrs = $960
1 hr = $720

Admission for 1 to 5 nights @ $719/ night = $719 - $3595

Cost of theatre for band 6 operation = $1717

Pay lost or insurance paid for time off work for hospitalization and recovery
Cost-effectiveness analysis

**Surgical repair**

**Costs**
- Anaesthetic → risk of morbidity
- Success rate of repairs is notoriously poor
- Hernia repair → risk of further hernia and other complications

**Benefits**
- Lifesaving if obstructed/strangulated
- Appliance adherence
- Back and respiratory problems improve
- Morale improves
Joe: born 1960 Crohn’s disease

1983 - Proctocolectomy, end ileostomy
   14 bowel obstructions (adhesions) since then
1984 – stoma resited due to hernia
1999 – Cholecystectomy
2003 – Parastomal abscess, septic arthritis
2004 – division adhesions, small bowel resection (fistula in ileostomy). Repair ventral hernia and new stoma on right. Mesh overlay on midline wound and on old stoma site.
2007 – Laparotomy, reduction and repair of parastomal hernia, stoma refashioned + mesh overlay
Susan: born 1944: Diverticular disease

1994 sigmoid colectomy Loop colostomy
1995 closure transverse colostomy + debridement umbilicus. Diarrhoea +++ for 6 months. Laparotomy, division adhesions +++ and formation of ileostomy
1998 RIF pain – early parastomal hernia

Surgeon noted: ‘These are almost inevitable and do not respond well to surgery’
Susan (2)

1998 Repair v large hernia
- Parastomal incision – ileostomy mobilized
- Marlex mesh to outside of fascia
- Resutured. Note v weak muscles laterally.

1999 – endoscopist notes large hiatus hernia

Susan (3)

Post operative wound infection needed home nursing visits then readmission for re-debridement of infected wound and packing.

Dec 2005 – removal of infected mesh
Hernia popped out again – many problems needing maxi bags to adhere. Gap filler.
Now wearing support garments. Does not want to have further surgery... ever!
George: born 1935 Ca rectum

1980 – APE + end colosotmy

2000 – very large hernia repaired with mesh overlay. Despite precautions became infected had to be removed months later.

Leaking appliances +++ “about 5 years”

2005 – visit to STN clinic – reclusive, obese, severe back problems refused support garments

2006 – microdiscectomy

2007 – gastric banding + support garments
Tools or toys?

- Are we playing or do these things really work?

- Surgeons are doing their best to get a technique that is successful – ‘need more published series with bigger numbers’.

- Are we (STNs) doing our ‘bit’? Is it enough just to get a support garment or does it need to be accompanied by exercises and education about avoidance of risk factors?… ‘need more published series with bigger numbers’.