



REVIEW

A review of contemporary surgical alternatives to permanent colostomy

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KEYWORDS

Neosphincter;
Dynamic graciloplasty;
Artificial bowel
sphincter;
Sacral nerve
stimulation;
Faecal incontinence

Abstract Objectives: To review the options available to patients with faecal incontinence with failed conservative treatment and/or failed anal sphincter repair and assessing the current indications and results of these options.

Methods: A literature search of MEDLINE, EMBASE and Cochrane databases was performed using the relevant search terms.

Results: Continent options for patients with severe or end stage faecal incontinence include the creation of a form of an anal neosphincter and more recently sacral nerve stimulation. Over half the patients, who are candidates, may benefit from these procedures, although long term results of sacral nerve stimulation are unknown. Dynamic graciloplasty improves the continence in 44–79% of the patients. The complications include frequent reoperations, high incidence of infection and obstructive defaecation. The success rates of artificial bowel sphincter vary between 24% and 79%. Once functional, the artificial bowel sphincter seems to improve the continence in the majority of the patients. Device removal due to infection, obstructive defaecation and pain is a frequent problem. Sacral nerve stimulation is claimed to result in improvement in continence in 35–100% of patients. The main risks in this procedure are infection, electrode displacement and pain.

Conclusions: All these procedures have high complication rates and have moderate success rates only. A major proportion of patients will need reoperations and hence high motivation is necessary for patients who undergo these procedures. A uniform standard for measurement of success is also necessary so that these procedures can be compared with each other.

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Introduction

Faecal incontinence affects an estimated 2% of the general population.¹ This tends to be under-reported by patients, largely as a result of embarrassment and unwillingness to discuss the problem with their family or their doctors.² The prevalence of faecal incontinence is even higher in older population.³ It is usually quite distressing for patients and does severely affect their social life.

Conservative medical management is usually tried first in most patients. Options include the use of anti-diarrhoeal medications, bulk laxatives as well as biofeedback. Conservative treatment succeeds in many, but not in all patients. Patients with anal sphincter defects and significant incontinence, who do not fare well on conservative measures, are candidates for overlapping sphincter repair. This succeeds in many patients. Occasionally a repeat sphincter repair can be performed, again with success in many patients.

There are, however, patients who would fail this or may not be candidate for such repairs such as patients with extensive sphincter destruction or those with neurogenic incontinence. In addition, patients with anorectal agenesis and absent anal sphincter or those who lose their sphincters following abdominoperineal resection obviously cannot be helped by sphincter repairs. These patients have been traditionally offered permanent stomas.

Stomas, however, may have a profound negative impact on the lifestyle of patients as well as their quality of life.^{4,5} This has always led to patients and physicians exploring alternatives to permanent stoma. This quest has resulted in various "neosphincters" in the last two decades and more recently interest in neuromodulation of anal sphincters. The aim of this review is to look at the current results of these procedures.

Methods

A literature search of MEDLINE (1966–2004), EMBASE (1974–2004), and Cochrane databases (Issue 3, 2004) was performed to identify the articles to be included. The search terms that we used were "artificial" AND "anus OR anal OR bowel" AND "sphincter*" (text), "neosphincter*" (text), "graciloplast*" (text), "(fecal OR faecal) AND (continent* OR incontinent*)" (text), "fecal incontinence" (MeSH), "anus" (MeSH), "Electric stimulation therapy" (MeSH), "Reconstructive Surgical Procedures" (MeSH). Further search through the reference section of relevant articles was performed to

identify any missed studies. All published studies which reported on at least five patients were included for this review. Reports of surgeries performed mainly after total anorectal reconstruction were excluded from the review. There were no language or study design restrictions.

Neosphincter procedures

Alternatives to permanent stomas have been developed over many years. Initially, various skeletal muscles were wrapped around the anus as a replacement sphincter (a neosphincter). The earliest reported attempt utilized the gluteus maximus muscle at the turn of the last century.⁶ The gracilis muscle, however, was much more popular in this regard, because of the nature of its neurovascular supply, its superficial location and also because it does not have any major function. Few authors reported the use of other skeletal muscles like adductor longus⁷ or free autogenous muscle transplants.⁸ Smooth muscle wraps⁹ has also been described. The introduction of electro-stimulation rekindled the interest in the gracilis muscle, which remains the most popular form of a muscle neosphincter.

Parallel to the development of the electro-stimulated muscle neosphincter, a totally artificial bowel sphincter was developed^{10,11} which maintains anal continence by an occluding cuff wrapped around the anal canal.

Dynamic (electrostimulated) graciloplasty

Graciloplasty had been described over 50 years ago by Pickrell et al.¹² The popularity of unstimulated graciloplasty has waxed and waned over the years. Despite early enthusiasm, the results have been generally inconsistent,¹³ but mostly poor. The fundamental problem with these procedures has been the reliance on voluntary contraction of these – fatigue prone (Type 2 muscle fibres) – muscles for extended periods of time to attain continence. To tackle this serious limitation of these procedures, a revolutionary concept was developed in the late 1980s, namely chronic muscle electro-stimulation. The idea behind this was to convert the easily fatiguable fast twitch Type 2 muscle fibres (ordinary muscles) into fatigue resistant slow contracting Type 1 muscle fibres (suitable for function as a sphincter, capable of sustained contraction).^{14,15}

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