



## Common anorectal problems

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### INDEX WORDS

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Children, just as adults, have a variety of common anorectal problems that can be quite bothersome. The presentation of these problems may be age-specific. Abscesses, fistulas, and fissures appear more commonly in infants and young children, whereas hemorrhoids and pilonidal disease are more common in teens and young adults. Fissures often can be treated medically but may require surgical treatment with lateral internal sphincterotomy. Abscesses and fistulas are common in infant males, especially robust infants who are breastfed. They may resolve with medical therapy but anal fistulotomy is not infrequently required. Hemorrhoids are rare in young children but may be an issue for teenagers. Acute symptomatic lesions may require excision if local measures cannot control the symptoms. Finally, pilonidal disease is a difficult problem for the patient and the surgeon. Persistently symptomatic lesions demand some type of surgical treatment but wound healing is poor in the intergluteal cleft region. More extensive procedures requiring the transfer of fasciocutaneous flaps may be necessary to provide definitive relief. Anorectal problems in infants and children are frequent and bothersome. Although most are not associated with tremendous morbidity, they can lead to much patient and parent anxiety as well as frequent medical consultation until the problem is successfully treated or resolves.

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Anal fissure is a longitudinal tear in the distal anal canal. This common problem may occur at any age, but typically presents around 2 years of age in children. Fissures present with rectal bleeding, pain, or crying with defecation; stools may be streaked with bright red blood. Gentle retraction and external examination of the canal reveals the diagnosis. Lesions are often in the posterior midline, but particularly in infants, may be found anywhere in the canal. Female infants commonly have anterior midline fissures. Skin tags or piles may remain as evidence of chronic inflammatory changes. Multiple or large lesions, as well as those off the midline should raise suspicion of a secondary cause. Aberrant findings on examination warrant biopsy, cultures, and endoscopic evaluation for other etiologies. These include Crohn's disease, malignancy, tuberculosis, venereal disease, or immunodeficiency.<sup>1</sup>

The pathogenesis of anal fissure is uncertain, but is postulated to involve internal anal sphincter hypertonia, anodermal ischemia, and chronic constipation. The classic teaching of mechanical disruption from hard stools with secondary constipation from stool avoidance causing cyclical damage from hard stools has fallen from favor. In adults, an accepted theory posits that elevated resting sphincter tone or muscle spasm leads to relative ischemia in the susceptible posterior midline.<sup>2,3</sup> Ulceration with subsequent bleeding and pain then follow.<sup>4</sup> It is unclear whether this paradigm applies in children. Although elevated internal anal sphincter pressures are noted,<sup>5</sup> the high rate of spontaneous resolution may be related to improved tissue perfusion or healing capacity.<sup>1</sup> Occasionally, an anal fissure may be seen in the newborn period, raising the possibility of a congenital origin.

Most anal fissures will heal spontaneously. Three placebo-controlled trials evaluated healing fissures with "chemical sphincterotomy."<sup>5-7</sup> Spontaneous recovery rates in these trials ranged from 10% to >75%. It is notable that the

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higher rate was achieved in a longer study with a more intensive bowel regimen. All patients received senna and lactulose during the intervention phase and laxatives in the 10 weeks before assessment.<sup>6</sup> The other trials were of shorter duration and offered lactulose only if patients were noted to be constipated.<sup>5,7</sup> This highlights the value of conservative therapy. Such measures include stool softeners, bulk laxatives, lubricants, water intake, and dietary modification. The goal is to minimize mechanical trauma of stool passage near the lesion. Treatment is recommended only for symptomatic anal fissures.

Internal anal sphincter hypertonia has long been a target for therapy of anal fissure. Nonhealing lesions were once managed surgically, but the risk of complications led researchers to seek alternative modalities. "Chemical sphincterotomy" with various compounds has been suggested and studied for the last 15 years in adults and more recently in children.

Glyceryl trinitrate (GTN) ointment was one of the first, and most thoroughly studied, chemicals. An organic nitrate, topical GTN has been shown to release nitric oxide. This decreases internal anal sphincter pressure and causes selective anodermal vasodilation, increasing tissue perfusion.<sup>8,9</sup> Lund and Schofield evaluated 23 adult patients with anal manometry before and after administration 0.2% GTN as well as 3 months after treatment. Mean maximum anal resting pressure fell from 116.3 ( $\pm 44.6$ ) to 66.3 ( $\pm 29.7$ ) cmH<sub>2</sub>O. At 3 months, all fissures had healed and pressure returned to baseline (112.3  $\pm$  44 cmH<sub>2</sub>O). A total of 35% developed recurrent symptoms which resolved with conservative measures; 43% of patients experienced transient headache, a common concern with nitrate therapy. There was no incontinence reported. A follow-up study in 15 children demonstrates effective healing with GTN dosed at 0.05% and 0.1%. Headaches were noted in approximately 15% of both groups.<sup>10</sup>

Three placebo-controlled randomized trials have been performed evaluating GTN in children with anal fissure.<sup>5-7</sup> Kenny and coworkers followed symptoms in 40 children treated with aggressive bowel regimen and 0.2% GTN paste or placebo. They found no significant difference in time to pain-free defecation or pain scores at recruitment, 6 weeks, or 16 weeks. No complications were noted. At completion, an overall healing rate of 84% was documented.

Tander and coworkers randomized 65 children to groups of 0.2% GTN, 10% lidocaine, or placebo. Manometry after administration of 0.2% GTN demonstrated decreased mean maximum anal resting pressure 27.9 to 12.65 cmH<sub>2</sub>O. At 8 weeks, the GTN group showed 84% complete healing and 94% symptomatic relief. Lidocaine and placebo yielded 21% and 35% recovery and 50% and 35% symptomatic relief, respectively. 89% of nonresponders had results from an additional course of GTN. One patient treated with GTN had transient fecal incontinence; no headaches were noted.

Sönmez and coworkers studied 102 children treated with 0.2% GTN, 10% lidocaine, EMLA cream, or placebo. Phys-

ical findings and symptoms were graded at 10 days and 8 weeks. Early response was noted in the GTN and EMLA groups. At 8 weeks, the GTN group had 82% complete healing and 91% symptomatic relief. The EMLA group demonstrated benefits over the lidocaine group with 64% versus 29% recovery and 76% versus 42% symptomatic relief. Placebo patients fared worse with 5% and 10% scores, respectively. Half of placebo patients had no symptomatic or physical response. One GTN and 2 placebo patients complained of fecal soiling; pruritis and burning sensation were also noted. Placebo patients fared worse in the above 2 trials than in most of the literature.

Calcium channel blockers have also been evaluated in adults for their smooth muscle relaxant effects.<sup>11,12</sup> Knight and coworkers followed a series of 71 patients treated with 2% diltiazem ointment; 75% reported healing by 3 months. Nearly half of the nonresponders healed with a second 2-month course. Perianal dermatitis was noted in 5.6%, headache in 1.4%. Jonas and coworkers compared oral versus topical diltiazem. Fifty patients randomized to 60 mg twice daily orally or 2% gel topically. Complete healing was noted in 38% and 65%, respectively. Mean maximum anal resting pressure decreased 15% and 23%. No change in blood pressure was noted. Oral administration was complicated by 8.3% rates of headaches and rash, and 13% nausea; no complications were noted in the topical group.

Topical nifedipine was randomized against lidocaine/hydrocortisone cream in 110 adults. Healing at 6 weeks was noted in 94.5% versus 16.4% control patients. Recurrence was treated successfully with nifedipine in 2 of 3 patients. No significant complications were noted.<sup>13</sup>

Botulinum toxin affects neurotransmission with subsequent prolonged but transient paralysis of muscle fibers. It offers the advantage of single treatment, but efficacy remains debated.<sup>14,15</sup> Thorton and coworkers reported a series of 57 patients injected with 20 units of toxin with improved mean anal resting pressure and healing. Siproudhis and coworkers performed a randomized trial of 44 patients with a single botulinum toxin injection versus placebo. There were no differences in healing or symptoms at 4 weeks. A similar proportion of each group required operative intervention by 3 months. A large series described a protocol of topical isosorbide dinitrate or nifedipine followed by botulinum toxin injection for nonresponders. Overall healing occurred in 71% of 455 patients; the remaining portion were referred for lateral sphincterotomy.<sup>16</sup>

As stated above, surgical therapy of anal fissure has a long, mostly successful history. The primary options remain anal dilation and lateral internal sphincterotomy. Although symptomatic improvement and healing are superior to medical therapy, postoperative incontinence rates are as high as 30%.<sup>17</sup> Dilation is believed to be more difficult to control and results in higher rates of mild incontinence. The procedure is not recommended.<sup>18</sup> Recent series of adults with lateral internal sphincterotomy yielded successful healing in greater than 90% of subjects with incontinence rates from

4% to 12%.<sup>19,20</sup> Lateral subcutaneous sphincterotomy was reported in 23 children. All fissures healed; 2 patients had recurrent pain and difficulty defecating despite a healed lesion.<sup>21</sup>

Medical and surgical therapies were directly compared in 4 recent studies of adults.<sup>22-25</sup> Evans and coworkers randomized 65 patients to topical 0.2% GTN versus lateral sphincterotomy. Fissures healed at 8 weeks in 60.6% and 97%, respectively; 45% of medically healed fissures recurred. Compliance with medical therapy was an issue. No long-term complications of operative therapy were reported. A similar study by Libertiny and coworkers evaluated outcomes in 70 patients at 24 months. GTN healed 54% compared with 100%, with 1 recurrence, with lateral internal sphincterotomy. The medical arm had more recurrences and responded well to surgery. Parellada performed a similar study in 54 patients with topical isosorbide dinitrate. The surgical group healed faster and at a higher rate. Half of this group experienced incontinence with persistence in 15%. Montes and coworkers compared botulinum toxin injection with lateral internal sphincterotomy. Again, surgical patients achieved faster and more persistent results with a higher rate of complications.

Nelson performed a meta-analysis of the randomized-controlled trials on medical therapy for anal fissure. GTN was slightly better than placebo and equivalent to diltiazem and nifedipine. Botulinum toxin was no more effective than placebo. Operative therapy offered the best rates of recovery [OR (odds ratio) = 12; range = 7-22%].<sup>18</sup>

Anal fissure is a common problem in young children which can be painful and disconcerting for parents. Observation, as well as medical and surgical modalities should play a role in the care of these patients. Asymptomatic lesions are likely to resolve and should be managed expectantly. If intervention is required, a trial of topical diltiazem or glyceryl trinitrate is indicated. Recurrences often respond to additional courses. For the rare child who fails to respond, lateral subcutaneous sphincterotomy is effective.

## Hemorrhoids

Hemorrhoids are extremely uncommon in children, with prevalence increasing in adolescents and adults. Children with portal hypertension have higher incidence but are rarely symptomatic.<sup>26</sup> Hemorrhoidal symptoms include bleeding, prolapse, itching, and pain. Stools may be streaked with blood, or parents may observe a bulge or dilated venous plexus at the anal orifice. The latter is more typical in constipated children.<sup>1</sup> Enlargement of hemorrhoids is related to straining and a low fiber diet. A matched case-control series of 47 patients demonstrates that skipping breakfast increases risk of hemorrhoids and anal fissure by 7.5-fold.<sup>27</sup>

Diagnosis is made on examination. Gentle spreading of the buttocks demonstrates external hemorrhoids, whereas

internal hemorrhoids require anoscopy. Digital examination is performed to evaluate tone and seek other conditions. If the patient is unable to strain or under general anesthesia, external hemorrhoids may be demonstrated by retracting an inflated rectal Foley catheter.<sup>28</sup> Hemorrhoidal cushions are found in the left lateral, right anterior, and posterior anal canal. In young men with hemorrhoids, maximal anal resting pressures are significantly higher than controls.<sup>2</sup>

External hemorrhoids arise below the dentate line and are consequently covered in anoderm. This cutaneous innervation can give rise to exquisite tenderness if thrombosed. Pain usually improves after 2 to 3 days as the clot organizes. It regresses in 1 to 2 weeks, but may give rise to a skin tag.<sup>29</sup>

Internal hemorrhoids are lined by columnar epithelium and have visceral innervation. As such, pain is a less common complaint, but bleeding and prolapse may occur. Internal hemorrhoids are graded by prolapse. Grade I bulge into the canal but will not prolapse. Grade II will prolapse with straining, but reduce spontaneously. Grade III must be reduced manually. Grade IV cannot be reduced.

Treatment of hemorrhoids in children is usually conservative. Dietary modification with increased fiber and liquid intake, bulk laxatives, decreased straining, and Sitz baths may alleviate symptoms. Most hemorrhoids in children will resolve with medical or no treatment. Thrombosed external hemorrhoids may be relieved with cooling packs. Within 48 to 72 hours, a thrombosed hemorrhoid may be excised with its overlying skin under local anesthesia. Internal hemorrhoids unresponsive to conservative management may be candidates for rubber band ligation. In adults, this technique may be curative for lower grade hemorrhoids, but has higher relapse rates for grade III and IV.<sup>30</sup> Although anesthesia is considered unnecessary, some patients experience considerable pain. This may be related to band placement near the dentate line or from aberrant cutaneous nerve fibers. A recent randomized study compared rubber band ligation to radiofrequency ablation for treatment of low-grade internal hemorrhoids. Ligation was noted to have higher pain ratings with a lower rate of recurrent bleeding.<sup>31</sup> Radiofrequency ablation is rarely used in the United States.

If conservative measures fail, surgical therapy is indicated. Hemorrhoidectomy may also be considered for high-grade internal hemorrhoids that are symptomatic or bleeding. Operations for hemorrhoidal disease are well described with a low rate of complications. Anal stricture, bleeding, infection, and fistula formation are the most common.<sup>32</sup>

Stapled hemorrhoidectomy is a newer technique that may be applicable to adolescents. A circular stapler removes excess anal mucosa. Several studies have shown improved pain and faster return to work. A series of 3711 adults reports low rates of complications: bleeding 4.3%, pain requiring admission 1.6%, stricture 1.4%, and abscess 0.03%. Recurrence occurred in 0.3% and anastomotic dehiscence 0.08% of patients.<sup>33</sup>



**Table 1** Results of initial treatment of perianal abscess

Technique	Recurrence rates
Incision and drainage <sup>36,38,41-45</sup>	18-40%
Single stab <sup>46</sup>	66%
Needle aspiration <sup>43</sup>	38%
Local wound care <sup>42,43</sup>	40-93%

Hemorrhoids are rare in children and can usually be managed conservatively. Rubber band ligation may be beneficial for symptomatic patients, as may hemorrhoidectomy.

## Perianal abscess and fistula-in-ano

Perianal abscess is relatively common in infants. It presents as a firm or fluctuant indurated lesion near the anal orifice, accompanied by discomfort and fever. Outright sepsis is rare. This simple infection can prove difficult to treat, with frequent recurrence or progression to fistula-in-ano. Fistulas are often low, simple, and subcutaneous; multiple and bilateral fistulas are common.

The true incidence and etiology are not known, but several facts suggest a congenital cause.<sup>34</sup> Most presentations are within the first year, with strong male predominance, often in breastfed babies. Patients are often otherwise robust and healthy, and an anatomic predilection has been noted.<sup>35</sup> Outside of infancy, fistulae usually have a defined stimulus. Crohn's disease, immunodeficiency, diabetes, postoperative and traumatic, are the most common, but an underlying cause need not be sought in the very young age group.<sup>36</sup> The etiology and treatment in infants remains a point of debate.

The derivation of fistula-in-ano from perianal abscess has long been accepted.<sup>37</sup> Infections within the crypts of Morgagni at the dentate line give rise to abscess and trigger an inflammatory response that may result in a fistula. Fitzgerald and coworkers first popularized a congenital etiology for fistula-in-ano.<sup>34</sup> He suggested an androgen imbalance creating abnormal anal glands, which favor formation of fistulae. Shafer and coworkers described irregular, thickened tissue at the dentate line which predisposed to cryptitis.<sup>35</sup> Abnormal crypts were noted in continuity to the fistula in 33 consecutive patients. Opening this crypt reduced their recurrence to 0. Others dispute the crypts role in the etiology of fistula-in-ano.<sup>38</sup>

Pople and Ralphs suggested aberrant migration of the urogenital sinus or hindgut could give rise to fistulous tracts.<sup>39</sup> Histologic studies by Al-Salem and coworkers demonstrate cases with isolated squamous or transitional epithelium, as well as tracts with mixed squamous, columnar, transitional, and glandular epithelium.<sup>40</sup> Although inflammatory metaplasia explains some of the variance, the presence of ectopic transitional epithelium supports entrapment of migratory cells.

The management of perianal abscess and fistula-in-ano is no less debated. Surgical drainage has long been the mainstay of treating perianal abscess, but recurrence rates historically range from 20% to 85%.<sup>36,41</sup> Incision and drainage is still the most common technique; some newer reports suggest needle aspiration or conservative management may suffice.<sup>42,43</sup> Compiled in Table 1 are combined rates of recurrent abscess and fistula-in-ano after various techniques of drainage.

In contrast to all other groups, the needle aspiration group predominantly remained on antibiotics. Adequate drainage is necessary to heal this lesion. A study of 50 adults randomized for packing of their drained abscess demonstrated no difference in recurrence.<sup>47</sup>

Likewise, debate continues on the necessity of seeking a fistula at the initial procedure (Figure 1). Although initial fistulotomy may offer lower rates of recurrence, some authors voice concern for iatrogenic injury.<sup>36,41</sup> Murthi and coworkers, note the highest rate of primary fistulas detected (20 of 27 sought) and describe a significantly higher recurrence rate if no fistulous tract is laid open at the initial procedure.<sup>45</sup> They recommend, however, against vigorous search. Besides the possibility of damage to the sphincter complex, extensive examination requires general anesthesia, while simple drainage may be performed with local anesthesia. Recurrent abscesses or persistent symptomatic sinuses should, however, be treated with fistulotomy.

Perianal abscess and fistulae in teens should be treated as in adults, and an underlying medical cause, such as Crohn's disease, should be considered. Four randomized controlled trials in adults with perianal abscess have compared incision



**Figure 1** Anal fistulotomy can be performed by probing the sinus opening using a nasal speculum in the anus and a lacrimal probe. The offending pore is virtually always obvious. The tract is opened and curetted, and will heal promptly. (Color version of figure is available online.)

and drainage with and without fistulotomy.<sup>48-51</sup> Simple drainage resulted in 15% to 41% recurrence, whereas drainage with fistulotomy ranged from 0% to 5%. A recent meta-analysis found sphincter-cutting procedures reduced recurrence by 83%, but doubled rates of incontinence to flatus and stool.<sup>52</sup> The increased risk of incontinence, up 40%, led some authors to advise against routine fistulotomy, specifically in the delayed setting.<sup>49,50</sup> Much of the pediatric literature supports fistulotomy if a tract is encountered at initial drainage.

Laying the tract open, including the involved crypt, may decrease recurrence. Shafer and coworkers describe recurrence dropping from 15% to 0% with this technique.<sup>35</sup> Nix and Stringer stress the value of performing fistulectomy if possible. In their series, it carried a 6.7% risk of recurrence versus 36% if the fistula is merely laid open.<sup>36</sup> In Festen and van Harten's series, they were unable to identify an inciting crypt in one quarter of the cases. This failed to affect recurrence, as did comparing fistulotomy or fistulectomy.<sup>41</sup> Two of the largest studies also fail to detect a difference.<sup>38,44</sup>

Seton placement is commonly performed for adults with complex fistulous disease, aiming to preserve continence. Theerapol, So, and Ngoi report a series of 47 adults treated with cutting and draining setons. Seventy percent were placed in the clinic without anesthesia. Seventy-eight percent healed in a median 9 weeks. No incontinence was reported.<sup>53</sup> Six children with trans-sphincteric fistulas were treated with cutting seton, again without general anesthesia. Division was complete within 1 month. There was no recurrence or incontinence.<sup>54</sup>

Conservative management of perianal abscess and fistula-in-ano has recent support.<sup>42,46</sup> Watanabe, Todani, and Yamamoto describe a series of 97 children treated with stab incision of abscesses and observation of fistulas. Parents were advised to stretch the wound open and give Sitz bath at diaper changes. Antibiotics were not prescribed. Thirty-three healed without recurrence; 31 children had 1 to 5 recurrences of abscess. Thirty-three patients progressed to fistula-in-ano, half of which recurred once or more. A total of 70% of cases resolved within 6 months; half of the fistulas persisted for a year. Six children required surgical intervention for failure to heal. Rosen and coworkers prospectively followed 18 healthy children with perianal abscess. Incision and drainage was performed in 4 patients due to significant discomfort or sepsis; the remaining abscesses drained spontaneously. Thirteen of these patients developed fistula-in-ano. All fistulas healed completely at an average of 6 months. Observed patients had no episodes of pain or fever. Their parents were satisfied with conservative management. Serour, Somekh, and Gorenstein report spontaneous cure of fistula in 42% of children at an average of 3 months.<sup>43</sup>

Antibiotic use for perianal abscess and fistula-in-ano is debatable. A trend toward decreased recurrence was noted in a series where needle aspiration was the primary mode of

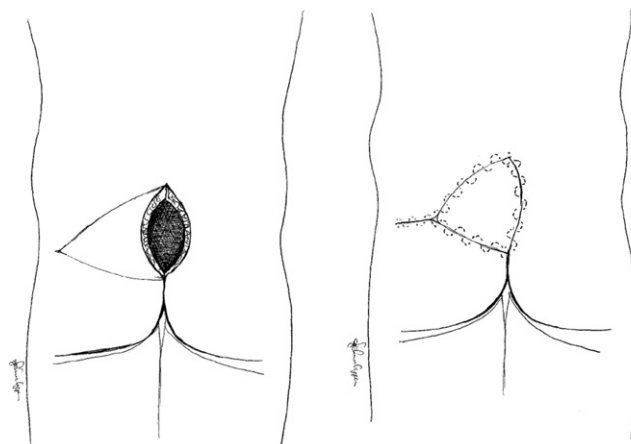
drainage.<sup>43</sup> Preoperative antibiotics had no effect on fistula development in another series.<sup>45</sup> Many series describe no antibiotic use.

Perianal abscess and fistula-in-ano are related conditions of congenital origin. Management strategies vary considerably with rare consistent success. Defined abscesses should be managed with incision and drainage to assure timely resolution. Local anesthesia with EMLA appears to be effective. Parents with a strong interest may be offered conservative management without fear of harming the child. Observation of fistula-in-ano is likewise acceptable for up to 1 year. No strong evidence supports one surgical technique over another.

## Pilonidal sinus and abscess

Pilonidal disease is one of the most recalcitrant problems faced by surgeons and their young patients. Although sacral pits and dimples are frequent in small children, it is not until adolescence that pilonidal disease comes to the fore due to the associated hair growth and increased skin oil. An excellent short review of the topic was published in 2003 by Chintapatla and coworkers.<sup>55</sup> The term pilonidal, comes from Latin, meaning nest of hair. According to work of Karydakis,<sup>56</sup> there are three factors that contribute to the pathogenesis of pilonidal disease: 1) the invader, which is loose hair; 2) the force, which causes the hair to insert into the skin; and 3) the vulnerability of the skin to the insertion of hair near the base of the intergluteal cleft. Pilonidal disease can occur in other areas, such as in the fingers of barbers, or in the scalp, but the focus here is on the sinuses and abscesses that arise in the intergluteal cleft.

Pits and dimples that are present in small children do not require attention unless they are a source of infection, which is not usually the case. Many will not bother patients throughout their lives. When the area becomes infected or inflamed, an abscess or draining sinus may form. Cellulitis requires treatment with antibiotics, especially if there is



**Figure 2** This fasciocutaneous flap is a relatively large V-Y advancement flap, as described by Schoeller et al.<sup>62</sup>

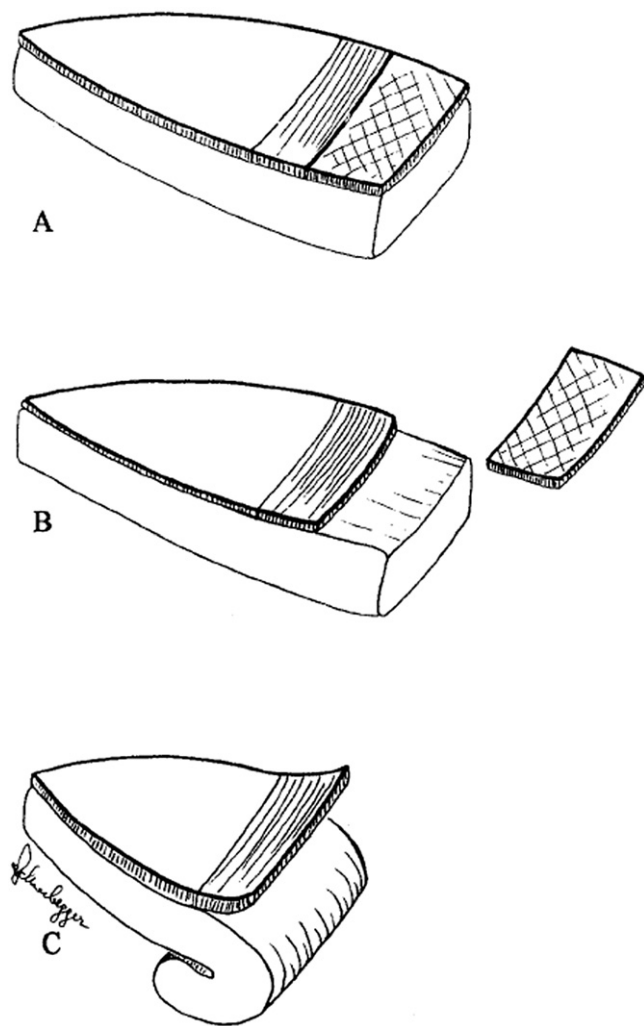
associated systemic toxicity, such as fever. Warm compresses and sitz baths may be beneficial in promoting drainage. Frank abscesses should be incised and drained. Some of these will subsequently heal, but many will go on to form chronic, draining sinuses. Some data suggests that curettage at the time of incision and drainage may increase the likelihood of healing.<sup>57</sup> Complete healing may occur in up to 60% of patients with about 25% recurrence after initial healing.<sup>58</sup> Recent success has also been reported with the use of vacuum-assisted (VAC) dressings to promote wound healing after excision.<sup>59</sup>

Definitive treatment of recurrent or recalcitrant pilonidal disease is a challenge in wound healing. A meta-analysis of treatment options by Allen-Mersh in 1990<sup>60</sup> revealed that most studies were flawed and that outcomes tended to be dependent on the surgeons' familiarity with the procedure utilized. Surgical options include: excision with primary

closure, excision with marsupialization of the skin edges to the base of the wound, excision without closure and allowing the wound to close by secondary intention as well as variety of flap procedures. When excising pilonidal disease, the authors utilize dilute methylene blue injected through one of the pores to stain the entire pilonidal network of sinuses. Care is taken to excise all of the blue stained tissue. With most of the simple excision procedures, there is a high likelihood of incomplete healing and/or recurrence, due to the anatomy of the area in which hair bearing skin adjacent to the wound is oriented to promote hair growth into the depths of the wound.

Many flap procedures have been described for treatment of sacrococcygeal pilonidal disease. Morden and coworkers at the University of Michigan reported good success using the Karydakis flap especially when compared with midline excision.<sup>61</sup> At the University of Wisconsin, we most often utilize a modified fasciocutaneous V-Y advancement flap, as described by Shoeller and coworkers.<sup>62</sup> This flap has the advantages of moving the suture lines off of the midline, providing some bulky tissue to fill the defect left after excision of the disease and flattening the intergluteal cleft so that hair is less likely to burrow into the skin (Figures 2 and 3). This procedure is usually performed in outpatient surgery, and healing typically occurs in 2 to 3 weeks.

Anorectal problems in children and adolescents are common and seem to have a bimodal age distribution. Treatment options vary widely, ranging from no treatment to medical as well as surgical treatment. Most problems that require surgery can be treated with fairly simple and straightforward procedures, but like most aspects of surgery, results vary and outcomes are improved by familiarity with the procedures used.



**Figure 3** (A) The medial portion of the flap is de-epithelialized and then rolled under to fill the soft tissue defect left by excision of the extensive nest of pilonidal sinuses. (B) Note that after de-epithelialization, the medial edge of the residual skin is undermined to try to eradicate the hair follicles. (C) The skin edges are sutured as shown in Figure 2.

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