Treatment of PS is dependent on the disease presentation. Abscess, chronic sinus, complexity of sinus, chronic recurrent of pilonidal abscess affects the treatment strategy. Each statement has different management option but wide, meticulous shaving and hygiene always should be main part of the all of the management options. In patients, presenting initially with simple midline pits or sinus tracts without acute abscess shaving can be offered as the initial treatment. During both primary and postoperative healing phase, shaving should be continued on a weekly treatment. Patients with acute pilonidal abscess require incision and drainage, ideally making the incision lateral to the midline. Dressing change, baths and shaving should be continued until the wound has healed. The majority of acute abscess treated in this way do not occur. Many patients will present initially with chronic pilonidal sinus. Location of the sinus will help to choose management way. In the case where all the disease sinuses and pits are located near and in the midline, the conservative midline excision or unroofing with curettage may be the first step treatment. However if the multiple draining sinuses exist and they are located far away from the midline, the simple excision may cause large wound defects. In these situations cleft lift procedures (Bascom) or excision with a rhomboid flap reconstruction. These procedures are also available for the recurrent disease or after failed primary midline excision operations. However, conservative treatment methods have little or no effects on perineal/perianal extensive hidradenitis suppurativa. Patients classified as Hurley stage III are usually referred for wide excision and reconstructive surgery. Therefore, surgical total excision must be considered even in the early stages of the disease to prevent further complications, such as abscesses, sinus tract and, fistula formations, and scarring. Management of the wound after total excision should be tailored to the individual patient. Although the incidence of squamous cell carcinoma is rare but it is the most serious complication of HS. The diagnosis and treatment of anal fistula and anorectal infection is a cornerstone of any busy and dedicated colon and rectal surgeons’ practice. Pilonidal sinus (PS) is not strictly a disease of the anus, because of its proximity to the anus and the occasional difficulty in differentiation from anal fistula, these patients commonly referred to a colon and a rectal surgeon for the treatment. Hidradenitis suppurativa (HS) which occurs more frequently in other areas of the body can be a diagnostic problem when it has seen and suspected in perineal area. Both PS and HS may present as a prolonged and long-suffering course of treatment for the patient and surgeon. This paper reviewed the treatment options of PS and HS briefly.

Key Words: Pilonidal sinus, hidradenitis suppurativa, wound healing

PILONALD SINUS -DISEASE

INTRODUCTION

Pilonidal disease firstly described in the medical literature in 1833 by William Mayo. In 1830, Hodges introduced the “pilonidal” which means “hair nest”. The term pilonidal “cyst” is a misnomer, because no epithelialized wall exists in the cavities this disease creates. Pilonidal sinus or is terminology that is more accurate to define this health problem. Pilonidal disease is a potentially debilitating condition affecting annually 70,000 patients in the United States alone. The real incidence of pilonidal disease is not known accurately but has been reported to affect up to 0.7% of adolescents and young adults and up to 8.8% of soldiers in the Turkish
army. Pilonidal sinus problem with long term medical and surgical treatments can be significant source of morbidity and disability.

Traditionally, treatment option was wide local surgical excision for PS. Nearly 80,000 soldiers were hospitalized for average of 55 days for wound healing after PS surgery I during World War II. World War II caused a major change in management and treatment options of PS such as non-operative modalities (shaving and hygiene) to operative modalities (excision and flap reconstructions). Management of PS should be tailored to individual clinical presentation but we should remember none of the so many treatment options has proved complete satisfaction.

Pathogenesis of the PS is also controversial. In the beginning it is believed as a congenital disease but currently PS is accepted as an acquired condition related to presence of hair in the gluteal cleft area. In the mechanism of PS, trans-dermal penetration of loose hairs in the natal cleft and a formation a foreign body reaction into the subcutaneous tissue, is the most accepted theory. This subcutaneous inflammation leads a formation of pits, mostly located in the midline and secondary infections.

The clinical presentations spectrum of PS varies from a chronically inflamed area and/ or sinus with persistent drainage to more acute presentation of an associated abscess or extensive subcutaneous tracts.

**CLINICAL EVALUATION**

The diagnosis of PS is most often a clinical finding in the gluteal cleft. However it is very important to make the differential diagnosis from hidradenitis suppurativa, perianal fistula, Crohn’s disease or infectious diseases (tuberculosis, syphilis and actinomycosis).

On physical examination, the presence of midline pits in the gluteal cleft, sometimes with hair or debris extruding from the openings is pathognomonic for PS. Additionally, in acute settings patients may present with cellulitis or a painful, fluctuant mass indicating the presence of an abscess. The chronic state is most of manifested by chronic draining sinus disease in the inter-gluteal fold and/or recurrent episodes of acute infections. It is also important to perform a thorough anorectal examination to evaluate for concomitant fistulous disease, Crohn’s disease, or other anorectal pathology. Additional laboratory or radiological workups are not routinely necessary.

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**TABLE 1**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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<tbody>
<tr>
<td>Stage I</td>
<td>Abscess formation, single or multiple, without sinus tracts and cicatrisation</td>
</tr>
<tr>
<td>Stage II</td>
<td>Single or multiple, widely separated, recurrent abscesses with tract formation and cicatrisation</td>
</tr>
<tr>
<td>Stage III</td>
<td>Diffuse or near-diffuse involvement, or multiple interconnected tracts and abscesses across the entire area</td>
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TREATMENT

There are many treatment options described in the literature but simply they can be categorized in two groups: nonsurgical and surgical.

NONSURGICAL METHODS

Treatment of chronic PS, shaving alone has been advocated as an alternative to surgery. Armstrong and Barcia tested this hypothesis that wide careful shaving is equal or superior to surgical therapy of any kind of chronic PS. The authors performed a pilot nonrandomized cohort study retrospectively. One group of patients was treated with weekly strip shaving until healing occurred and the other group was treated with surgery. Then they followed the patients for 3 years, comparing the number of occupied bed days and number of operations required. The authors found highly statistically significant difference in favor of the group received only shaving with lower number of occupied bed-days, with only 23 operations required in 101 consecutive cases of conservative management with weekly shaving. Although this study shows significant benefit for shaving alone. The weakness of this study is the authors did not control and compare the types of surgery performed in non-conservative group or for the severity of disease. Healing and recurrence rates were not reported also. Furthermore, the conservatively treated patients were not occupying hospital beds. Despite these limitations, this study provides evidence that shaving as a treatment of PS, effectively controls PS in the non-operative outpatient setting while promoting near-normal work status and is preferred over excisional methods.

The use of phenol (solutions or crystals), with cautious protection of surrounding skin, removal of sinus hairs and debris with forceps as well as local shaving is one of the promising nonsurgical methods. Small series have demonstrated success rates ranging from 60-95%. Even in the setting of recurrent chronic sinus disease, phenol and local depilatory cream applications on a weekly basis has shown low recurrence rates (0-11%) at long term follow ups.

SURGICAL METHODS

Surgical treatment of PS has many options from simple incision and drainage to wide excisions and flap reconstructions. Surgical treatment includes incisional and excisional procedures with or without different closure techniques. As the acquired theory for PS has gained wide acceptance, wide excision techniques have fallen out of favor. Nowadays minimally aggressive surgical techniques for PS are accepted as the treatment of choice, and became very popular. The benefit of the patient is by decreasing the hospital stay and minimizing the morbidity.

For acute PS with abscess or without associated cellulitis, the main surgical approach is still drainage and cleansing of the abscess cavity followed by regular outpatient basis until complete healing. After simple drainage procedures for the first attack of acute PS, overall healing rates have been reported approximately 60%, the unhealed rest of them has been needed an additional operations. During the follow up period, recurrent dis-
ease after complete healing occurs in nearly 10-15%, which correspond, to a higher recurrence rates.

Chronic form of PS presents its self with recurrent abscesses with interval periods of complete resolution or persistent non-healing, draining wound. The surgical treatment of chronic disease is generally divided in two category: excision & primary closure, excision & secondary healing.

Most chronic PS are located midline, therefore the most common operation is midline excision with or without primary closure. En bloc, excision is made of the entire pilonidal sinus. It is not necessary to always excise down to presacral fascia. In secondary healing technique, the wound can be packed with moist gauze and dressings are changed daily. Excision with secondary healing is associated with prolonged healing times. Fuzun et al\textsuperscript{29} randomized 91 patients to either excision without closure or excision with primary closure. In the study, the postoperative minimum follow up period was 4 months. The primary endpoint of the study was infectious and recurrence rates. No antibiotics was used in the study. Patients whose wounds were left open had a lower infection rate (1.8% vs. 3.6% p<0.01) and there is difference in terms of recurrence rate (open group 4.4% vs. 0% p<0.01).

The utility of antibiotics has been evaluated in three situations: Perioperative prophylaxis, postoperative treatment, and topical use. In prophylactic setting, limited data is available in the literature. An intravenous single dose before excision and primary closure of chronic PS resulted in no difference in wound complication or healing rates in comparison with those not receiving antibiotics\textsuperscript{30}. One small, randomized, blinded study comparing single dose prophylactic metronidazole versus cefuroxime and metronidazole preoperatively followed 5 days oral ampicillin sulbactam demonstrated no difference in wound infections at 1 week\textsuperscript{31}. There was no difference in overall wound healing was identified in comparison of 1 and 4 day courses of perioperative metronidazole and ampicillin following excision and primary closure\textsuperscript{32}. In postoperative setting, antibiotics have shown mixed results. As an adjunct to primary excision in chronic pilonidal disease comparing those left to heal by secondary intention, following primary closure, or undergoing primary closure plus 2 weeks of clindamycin\textsuperscript{33}. Of the 3 groups, only secondary intention was associated with the delayed healing. On the other hand, the addition of metronidazole for 14 days or metronidazole with erythromycin following excision and secondary intention wound healing of chronic PS showed a slightly shorter healing times for the antibiotic group than without antibiotic group\textsuperscript{34}. In addition, there was no difference in wound healing with double coverage erythromycin therapy. Additional studies using longer durations of variety of a single - and double coverage antibiotic regimens have failed to demonstrate any clear advantage\textsuperscript{35-37}.

The use of topical antibiotic regimens have conflicts and controversies in the treatment of PS. Only one report showed significantly higher wound healing rates ( 86% vs. 35% p<0.001) after excision of chronic disease or previously drained acute abscess and packing with an absorbable gentamicin impregnated collagen based sponge with overlying primary wound closure than without antibiotic packing\textsuperscript{38}. Unfortunately, the contributions of the gentamicin could not be separated. A more recent study comparing primary closure over gentamicin soaked sponge versus secondary healing showed quicker healing and lower cost in closed group\textsuperscript{39}. On the other hand another investigation concluded that there was no benefit to closure over the sponge versus closure without it\textsuperscript{40}. Overall, the utility of antibiotics in topical or systemic applications remains unclear. Adjunctive use should be con-
sidered in the setting of severe cellulitis, underlying immunosuppression or with systemic disease.

In both the adjunctive role to primary surgical treatment and a result to prevent recurrence, shaving (along with hygiene enforcement and limited lateral incision and drainage of abscess) has shown that less length of stay in hospital, less surgical procedures, and earlier return to work in terms of all surgical procedures has also been used as a standard part of the postoperative treatment in various surgical techniques. The most effective frequency and extent of shaving yet to be clarified. Laser epilation has been approved for primary and secondary PS.

For patients who underwent primary wound closure, the healing period have some clear advantages in the off midline group to midline closure group. Limited and conflicting data is available comparing the efficacies of excision with marsupialization to primary closure. In general primary closure is associated with quick healing times with higher recurrence rates.

If the surgeon prefers to do a primary closure (except flap techniques) off midline technique must be the preferred approach (vertical or oblique) This has consistently demonstrated faster healing period, lower recurrence and wound morbidity rates.

The other main surgical options are excision and flap techniques. These techniques are favorable in both primary and recurrent diseases. There are many flap options such as Karydakis, Z, rhomboid, Limberg. In the flap techniques, all sinuses are removed down to the presacral fascia and rotation of a fasciocutaneous flap (Figure 1) that results in flattening of gluteal cleft. Overall results are favorable with respect to disease recurrence (0-6%) and healing period. The data from randomized trials found lower (0-6%) overall rates of surgical site infection. Additional data indicate significantly lower recurrence rates after rhomboid flaps techniques vs. V-Y advancement flaps a no differences were found in wound complications, seroma formation or length of hospital stay.

The Karydakis flap is a popular and easy flap technique that uses a mobilized fasciocutaneous flap secured to sacrococcygeal fascia with lateral suture lines. Karydakis reviewed his personal series of more than 6000 patients treated with this technique in 1992, with a recurrence rate less than 2% and wound complications 8%. Similar findings reported in case series with this technique. In a single randomized, controlled study comparing the Karydakis procedure with open healing Karydakis repair resulted in a 6% recurrence rate, 20% wound morbidity, and 98% overall healing rate at a follow up three years. In two randomized trials, Karydakis and Limberg flaps were evaluated and two flap procedures were found relatively equal in terms of postoperative results.

The cleft lift technique also creates a flap based coverage with closure off midline, obliterating the cleft altogether. Bascom and Bascom, have reported successful healing in 28 recurrent and complicated PS. Additional case series confirmed healing rates of over 80% to 95% in both primary and recurrent settings. Wright et al, showed slightly higher recurrence rates of 12% in cleft lift technique. Several other flaps have been used for PS including V-Y advancement and Z-plasty techniques. Minor wound complications, > 90% healing and low recurrence rates have been reported in the series.

**HIDRADENITIS SUPPURATIVA**

**INTRODUCTION**

Verneuil’s disease, or hidradenitis suppurativa, is a chronic suppurative disease with a tendency to sinus formation, fibrosis, and sclerosis. It is a disease of the apocrine sweat glands and may arise from each of the localizations where apocrine glands are prominent: axilla, nipples, umbilicus, perineum, groin, and buttocks. Extensive hidradenitis suppurativa of the perineal/perianal and the gluteal regions constitute a serious social problem.

Although the pathophysiology is poorly understood, the general belief is that the obstruction of the apocrine and/or follicular pores results with the dilatation of the glands and bacterial super infection following by the rup-
ture of the glands and the dissemination of infection throughout the subcutaneous tissue planes. In contrast, some authors claim that despite its suppurativa nature, HS is almost certainly not a disease initiated by infection and is probably a condition not even primarily affecting the (apocrine) sweat glands.

In addition to being related to obesity, there are other myths associated with HS, such as diabetes mellitus, poor hygiene, deodorants, and chemical depilation. The disease almost always occurs after puberty and before aged 40 years leading to the theory that there is a hormonal component in the pathogenesis. There also seems to be a genetic component, and in one study of 110 patients, 38 percent reported a family history of this disease. This may reflect a familial form with autosomal dominant inheritance.

SYMPTOMS AND FINDINGS

Patients mostly have recurrent painful abscesses and malodorous discharge necessitating regular dressings, the disease is highly debilitating for sufferers both physically and psychologically leading to social isolation, failed relationships, and depression. HS is seen predominantly in the axillary area and often is self-limiting, rarely requiring a surgical procedure. However perineal, perianal, and gluteal HS usually requires some form of surgical treatment. The clinical aspect is sometimes very peculiar: the deep-seated abscesses and sinus are closely associated in a unique lesion slowly extending at the periphery during a period of years. The lesions may be very large, solitary, and deep. Such single macro lesions may be mistaken for regular abscesses of the muscle or even bone-derived lesions. Therefore, lesions of the buttock are easily differentiated from superficial follicular inflammation.

TREATMENT

Hurley’s criteria for hidradenitis suppurativa staging is used to assess the severity of the disease and to choose the appropriate treatment principles (Table 1). According to Hurley’s criteria, it is believed that 75% of all cases remain in stage I after the initial diagnosis, whereas 24% progress to stage II and 1% progress to stage III (Figure 2).

Although there are a number of reports concerning different types of medical management with altering combinations of various drugs, including topical and/or systemic antibiotics for stage I-II disease, the effectively of medical approach is still controversial. The initiated medical treatment leads to delayed surgical intervention having been reserved for stage II-III patients with extensive skin and soft-tissue involvement. On the other hand, most surgeons believe that the surgical approach via excision of the affected tissues is the only curative treatment and early referral for operative resection may limit the extent of this debilitating disease.

Treatment of HS can be accomplished through medical or surgical procedures. The most radical and totally curative treatment modality is accepted to be surgery. Incision and drainage, performed in acute situations in various surgeries, are probably the most common treatments for HS patients, and may sometimes lead to temporary control of symptoms.

Unroofing and exteriorization of the sinus tracts may be of value. Proper exteriorization involves removal of the “roofs” of sinus tracts, removal of all granulation tissue, which in some cases may be rather extensive, and slow healing by secondary intention. It is speculated that optimal exteriorization is highly dependent on the skill and training of the surgeon, and that optimal results may be easier to obtain with an excision. It is common to find large areas of skin undermined with tracks running for long distances, but usually at the same depth. Unroofing all the fistulous tracts and abscesses may be considered to create an extensive open wound consisting of multiple interconnected bridges of skin, which can make healing easier and faster.

Surgery for curative intent requires complete excision of diseased skin. Excision with primary closure may be performed in selected small wounds if it can be closed without tension. This treatment modality results in decreased morbidity, length of hospitalization, postoperative disability. Others have advocated wide excision and healing by secondary intention. Balik et al, reported wide excision, (all of the grossly involved apocrine bearing skin in the perineal area should be excised full thickness into the uninvolved gluteal fat) and secondary intention is good option for treatment of HS (Figure 3). This procedure does not require stoma. Balik et al, also concluded that the most important complication of HS is squamous cell carcinoma (Figure 4). Patients with large areas of affected by HS may require staged excision. The extent of excision should remain outside the anal verge as long as there is no obvious involvement or history of anal canal involvement. If excision near the anal canal is necessary, it should be limited and staged in regards of prevention of anal stricture. Prolonged healing is the main disadvantage of this method. These patients require daily dressing and wound care to prevent the contracture formation. Recently, vacuum assisted closure (VAC) method seemed to decrease the wound healing period and shortens the length of hospitalization. The main disadvantages of the VAC are the cost and technical issues. The device can’t be used at the level of perianal margin and anal verge. At these levels application of the device is extremely difficult. At this point the other solution for the wound healing is immediate or delayed thickness skin grafting after wide excisions (Figure 5). Also cutaneous or myocutaneous flaps can be offered for wound healing as same as PS (Figure 6).

SUMMARY

TEHNIÈKE OPCIJE U LEÈENJU PILONIDALNOG SINUSA I SUPURATIVNOG HIDRADOENITA

Dijagnoza i leèenje analne fistule i anorektalnih infekcija je nezaobilazna osnova rada svakog uposlenog i posveæenog kolorektalnog hirurga. Pilonidalni sinus (PS)
nije striktno bolest anusa, ali zbog njegove blizine su ovi pacijenti se najčešće upućuju kolorektalnim hirurzima. Hidradenitis suppurativa (HS) se često javlja na drugim delovima tela i predstavlja dijagnostički problem kada se javi u regiji perineuma. Oba entiteta mogu imati dug put do izljevenja, i za hirurga i za pacijenta. Ovaj rad predstavlja pregled opcija u tretmanu PS i HS.

Kljūćne reči: pilonidal sinus, supurativni hidradenitis, lečenje

REFERENCES


