



LASER SURGERY FOR PILONIDAL DISEASE – A NOVEL MINIMALLY INVASIVE PROCEDURE

Tihomir Grgić^{1,2}, Dora Grgić³, Mirna Žulec⁴, Fran Rašić⁵, Zvonimir Zadro¹, Karlo Golubić⁶ and Kristina Šemanjski¹

¹Sveti Duh University Hospital, University of Zagreb, School of Medicine, Zagreb, Croatia;

²St. Catherine Specialty Hospital, Zagreb, Croatia;

³Zagreb University Hospital Center, University of Zagreb, School of Medicine, Zagreb, Croatia;

⁴Marija Polyclinic, Zagreb, Croatia;

⁵University of Zagreb, School of Medicine, Zagreb, Croatia;

⁶Sestre milosrdnice University Hospital Center, Zagreb, Croatia

SUMMARY – Pilonidal disease (PD) is a common inflammatory disease of the gluteal region with an incidence of 26/100000 and usually occurs in young males (15-30 years old). The etiology of pilonidal disease is unclear, but literature describes a wide range of factors such as keratin plugs, foreign substance reaction related to hairs, as well as dermatopathy and debris in hair follicles in the natal cleft. PD and also its classic treatment can cause discomfort and very much deteriorate the patient's quality of life. There are many possibilities (conservative or surgical) in the treatment of pilonidal disease, but there is no gold standard. In the acute phase (abscess), surgical incision with pus evacuation and antibiotic therapy is enough. In the chronic phase, there are many possibilities like phenol treatment, surgical excision with lay open and secondary wound healing. There are many reconstructive techniques such as Karydakis, V-Y flap or Limberg flap. A recently minimally invasive technique such as endoscopic surgical procedure or filling pilonidal tract with fibrin glue or phenol have been introduced. We present our experience with laser treatment (Biolitec, Germany) of pilonidal sinus disease.

Key words: *Pilonidal sinus; Laser surgery; Surgical flap; Endoscopic surgical procedure*

Introduction

Pilonidal disease (PD) was first described in 1883 by Herbert Mayo. It primarily affects young males, it is three times more common in men than in women, with the incidence of 26/100000. PD is chronic irritation and secondary infection of hair follicles located

in the gluteal cleft but can be caused by keratin plugs or dermatitis in the gluteal cleft¹. Predisposing factors for PD are family history, obesity, chronic trauma or irritation such as long-lasting driving, occupation, poor hygiene, dark skin color, long-lasting sitting, and hairiness. Nowadays, Pilonidal disease (PD) is an important cause of morbidity and loss of work productivity²⁻⁴.

There are two different phases in PD, acute and chronic. In the acute phase, initial treatment is unroofing of abscess and drainage in combination with antibiotic therapy. Delayed definitive therapy is indicated after abscess drainage and resolution of secretion⁵.

Correspondence to: *Tihomir Grgić, MD, PhD*, Sveti Duh University Hospital, Sveti Duh 64, HR-10000 Zagreb, Croatia
E-mail: tihomir.grgic@gmail.com

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There is no gold standard for surgical treatment of PD. Most surgeons prefer excision of the pilonidal tract with secondary wound healing⁶. Also, there are some reconstructive techniques for definitive treatment of PD such as Karydakias procedure, V-Y flap procedure, and Limberg flap procedure⁷⁻⁹. All of them have a recurrence rate and some disadvantages, e.g., secondary infection, etc. Minimally invasive procedures include phenol application, fibrin glue application or endoscopic surgical treatment. Recently, we have introduced laser treatment of PD with the Biolitec 1480 nm laser probe. The laser as a minimally invasive procedure has been used in surgical procedures for hemorrhoid disease and varicose vein treatments^{1,10-12}.

Materials and Methods

From October 2017 until September 2018, a total of 30 patients including 25 males and 5 females, average age 25 and 23 years, respectively, were operated on with laser technique by a single surgeon. All patients were informed about the technique and provided their informed consent.

Acute abscess and recurrence after previous surgical treatment were excluded from the study.

Preoperative antibiotic therapy was not administered, and all patients were operated in local anesthesia (a 1:1 combination of lidocaine and bupivacaine). All patients were placed in a prone position, and after shaving, cleaning and scrubbing the operative field, different pits were enlarged and hairs were removed from the sinus (Figs. 1 and 2). Then, the whole sinus was explored by a stylet to determine the length, direction, and size of each one. Before laser procedure, saline was injected into the tract and the skin around the pits to cool and avoid the burning effect of tissues. For laser treatment, we used Biolitec radial diode laser probe at 1470 nm wavelength laser energy 10 watts in a continuous way. We applied laser energy at an approximate 1 mm *per* second and sinus shrank and closed (Fig. 3). If it did not close after the first withdrawal, we repeated the procedure. After the procedure, we used compress to protect the pits and patients were allowed to leave our clinic 2 hours after the procedure.

Postoperatively, no particular care was required, only protection of the pits after a shower or after

washing region. The patient took painkillers as long as they needed to. If they had infection or secretion from the pits antibiotics were prescribed.

Follow up was scheduled 3 days after the procedure and then subsequently after one month and three months (Fig. 4). All patients were given a recommendation for laser hair epilation from the sacral region.

We contacted all patients 6 months and 1 year after the procedure to check their local status and satisfaction with the method.

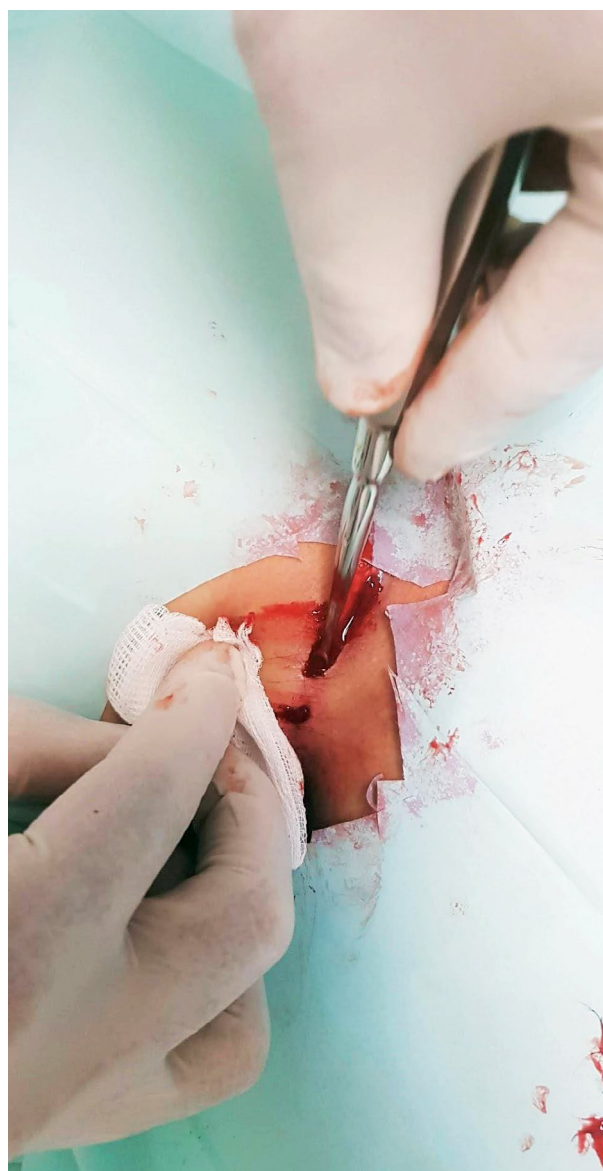


Fig. 1. Pit pitting.



Fig. 2. Removed hair.



Fig. 3. Laser application.



Fig. 4. Follow up examination one month after the procedure.

Results

The success rate of the procedure was 96.7% and 95% Clopper-Pearson confidence interval (82.8%-99.9%); there was only 1 recurrence in 30 procedures. The mean follow up was 215 (range 190-300) days. All patients were discharged after 2 hours of the procedure. Patients took pain killers for 3-10 days after the procedure and the mean duration of soiling before healing

was 20 days. Two patients had complications, i.e., a hematoma and postoperative infection in one patient each. All complications were treated conservatively.

We recommended laser epilation of the sacral region to all patients in order to prevent recurrent pilonidal disease after regression of secretion post procedurally.

Discussion

There is no consensus about the best operative solutions for pilonidal sinus treatment; classic surgical procedures such as wide excision and laying open or wide excision with primary closure (Karydakis) or V-Y or Limberg flap is an invasive and uncomfortable technique for all patients. Better results are reported for the flap technique with about 1% of recurrences¹³⁻¹⁵. Most surgeons prefer wide excision with or without primary suturing because it is simple and easy to learn. The recurrence rates reported for an open technique vary widely, from 0% to 57%. The greatest discomfort for patients is prolonged wound healing, which can take 1.5 to 6 months. The average time off work for these patients is one month.

In some cases, healing is not complete and it can lead to a chronic wound. The most common reason for reoperation after excision and wide open is non-healing wounds.

After the Karydakis technique, a 4% recurrence rate and 9% wound dehiscence are described. Limberg flap is one of the off midline procedure, where a rhomboid subcutaneous flap is mobilized and transposed to cover the defect. The recurrence rate for Limberg flap is 4%-6% and the wound dehiscence rate varies from 0% to 45%. The minimally invasive technique is becoming increasingly popular as an outpatient procedure¹⁶. It is technically simple and patient satisfaction is high. In the past 10 years, a novel minimally invasive technique for pilonidal sinus treatment, i.e., laser treatment has been developed. Using laser is advantageous because the procedure can be performed under local anesthesia, enables faster return to normal activity, and reduces the consumption of analgesics. A minimally invasive treatment such as laser application also results in better cosmetic effect for patients. Postoperative care after a laser procedure is very simple and patients are away from work for a minimal time period.

Our results show that the rate of postoperative complications and the rate of disease recurrences were also reduced. Other advantages of laser surgery over the conventional one and other minimally invasive methods remain to be demonstrated^{1,17-19}.

Conclusion

Laser treatment of PD is a safe and simple minimally invasive technique with a very good success rate. It can be performed under local anesthesia and postoperative pain is minimal. Time off work for patients is very short, complication rates are low, and so is the patient's need of postoperative care. In the future, laser surgery for PD should be the first-line treatment option for the majority of patients.

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Sažetak

LASERSKA KIRURGIJA U LIJEČENJU PILONIDALNE BOLESTI – NOVI MINIMALNO INVAZIVNI ZAHVAT

T. Grgić, D. Grgić, M. Žulec, F. Rašić, Z. Zadro, K. Golubić i K. Šemanjski

Pilonidalna bolest (PD) je česta upalna bolest glutealne regije s incidencijom od 26/100000 osoba, koja je česta u mlađe muške populacije (15-30 godina). Uzrok pilonidalne bolesti je nejasan, u literaturi se opisuje širok spektar uzroka kao što su keratinski čep, reakcija na strano tijelo na dlaku i dermatopatija u folikulima dlačica u škržnoj pukotini. Klasično liječenje pilonidalne bolesti može uzrokovati niz problema i bitno utjecati na kvalitetu života. Postoji dosta terapijskih mogućnosti liječenja pilonidalne bolesti, ali ne postoji zlatni standard. U akutnoj fazi bolesti kirurška incizija u kombinaciji s antibiotskom terapijom je terapija izbora. U kroničnoj fazi bolesti postoji niz mogućih terapijskih rješenja kao što su aplikacija fenola, široka kirurška ekscizija sa sekundarnim cijeljenjem rane ili se mogu primijeniti rekonstruktivne tehnike: Karydakias, V-Y režanj, Limberg režanj. Odnedavno se uvode i minimalno invazivne tehnike u liječenju pilonidalne bolesti kao što su endoskopsko liječenje, aplikacija fibrinskog ljepila ili fenola. U ovom radu opisujemo naše rezultate liječenja pilonidalne bolesti laserom (Biolitec, Njemačka).

Ključne riječi: *Pilonidalni sinus; Laserska kirurgija; Kirurški režanj; Endoskopski kirurški zahvat*