Perspective

Pilonidal sinus and endoscopic surgery—myth or reality?

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Abstract: Recently a minimally invasive procedure to treat pilonidal sinus has been started to spread. In the new era of minimally invasive surgery, pilonidal sinus could become a disease treated with an endoscopic approach. The advantages are evident: there are no surgical wounds on the buttocks, there are minimal patient inconveniences with minimal pain and wound care, and the technique facilitates immediate return to work and normal activities. It is the time to talk about the endoscopic treatment of pilonidal sinus; it is the time to thoroughly study every fold of this procedure in the effort of identifying indication, contraindications, advantages and disadvantages of a new weapon available against this tricky disease.

Keywords: Pilonidal; minimally invasive; endoscopic; Video Assisted Ablation of Pilonidal Sinus (VAAPS); Endoscopic Pilonidal Sinus Treatment (E.P.Si.T.)

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Introduction

Pilonidal Sinus is a disease frequently encountered in clinical practice, nevertheless its treatment has remained controversial, since it was first described by Mayo in 1833 (1). In 1990 Allen-Mersh published an extensive review of over 90 papers about the treatment of pilonidal sinus (2). The conclusion was that: "*the choice of a particular surgical approach is dependent on the surgeon's familiarity with the procedure and perceived results in terms of low recurrence of the sinus and of quick healing of the resulting cavity or surgical wound*". Twenty years later, this statement is still true; the management of chronic pilonidal sinus is not standardized and it is subject to an open debate (3).

A minimally invasive procedure aimed to the treatment of pilonidal sinus is recently started to spread. Thus, in the era of minimally invasive surgery, could endoscopic approach be a new way to treat pilonidal sinus?

State of art of pilonidal sinus treatment

To treat pilonidal sinus, during the years, many surgical methods have been introduced. Nevertheless, in literature no consensus on the optimal treatment can be found.

No high level of evidential data about treatment choice can be found in current literature (3-7). Several data were based on low- or moderate-quality trials. In our opinion, one of the major limitations of current literature is that the most of the published studies had a short follow-up. Basing on the short-term follow-up (1 year), it is impossible to draw definitive conclusions about the recurrence rate of the minimally invasive technique. According to Doll (8), at least a 5-year follow-up should be considered the gold standard in pilonidal sinus surgery study. Considering this, definitive conclusion about the best choice in pilonidal sinus treatment. However, some of the questions about the best surgical technique for chronic pilonidal disease have now been answered:

(I) "Less is more" is a worldwide corroborated concept. It is the time to abandon the open radical excision;
(II) Open healing showed no clinical benefit over surgical closure;
(III) Sinusotomy/sinusectomy or *en bloc* resection with primary closure could be considered the preferred approaches;

Table 1 Studies' characteristics

Author	Year	Study design	Patients	Follow up (months)	Infection	Recurrence	Time off work (days)
Milone *et al.*	2013	Prospective	27	12	0	1	3
Chia *et al.*	2015	Retrospective	9	2.5 [1–5]	NR	NR	NR
Meinero *et al.*	2014	Prospective	11	9	NR	0	3 [1–5]
Meinero *et al.*	2016	Prospective	250	12	0	13	2±0.5
Milone *et al.*	2016	RCT	145	12	1	3	1.6±1.7
Javed *et al.*	2016	Prospective	40	6	0	4	2.5 [2–4]
Gecim *et al.*	2017	Prospective	23	22	0	0	3.03±2.95
Giarratano *et al.*	2017	Prospective	77	25	0	4	6±3
Jain *et al.*	2017	Prospective	19	NR	0	4	NR

(IV) Wounds heal more quickly after primary closure, but risk of recurrence is higher;
(V) "To flat" is the gold standard of primary closure. When surgical closure is the chosen treatment option, off-midline should be considered standard management for pilonidal sinus. Midline closure should be abandoned, since associated with an increased recurrence rate and higher incidence of wound complications;
(VI) Drain use should be individualized. Drainage could not be associated with a better outcome (9,10);
(VII) Fibrin sealant seems to be useless (11).

Update on minimally invasive treatment of pilonidal sinus (*Table 1*)

The idea of a less radical treatment of pilonidal sinus goes back to World War II. During the world conflict in fact, Phillips (12) suggested a less invasive treatment of infected pilonidal sinuses "*to keep the fighting man in a fit condition for combat*". Again later, in 1970, Patey (13) stated: "*Don't take a hammer to swat a fly!*". In the late 60s Lord and Millar (14,15) introduced the debridement of the sinus using a rounded brush. In 1983 Bascom (16,17) developed a surgical procedure based on the excision of the pilonidal orifices combined with a parallel lateral incision aimed to obtain the debridement of the cavity.

In the last decade, supported by the statement "less is more" many surgeons developed minimally invasive treatment of pilonidal sinus (18-20). Minimally invasive techniques for pilonidal sinus consist of sinusectomy, it means the circumferential incision of the pilonidal orifices avoiding cutaneous margins and a selective subcutaneous extirpation of the sinus without closure of the wound. Satisfactory preliminary results, in terms of time off work and recurrence rates have been achieved by both sinusectomy (19) and sinusectomy by trephines (20).

A new endoscopic treatment for pilonidal sinus has been recently proposed (21-25): the Video Assisted Ablation of Pilonidal Sinus (VAAPS) technique. Its rationale is based on the concept of complete removal by ablation of the sinus though a small surgical access. The conventional surgical technique consists in creating an elliptical wedge of skin and subcutaneous tissue to remove the cavity and its lateral tracks. In contrast, this new technique creates a small elliptical wedge of the subcutaneous tissue, including the inflamed tissue and organic debris, leaving the overlying skin intact.

In our preliminary experience is based on 27 patients (21). Of these all of them immediately returned to normal activities and work and recurrence rates registered were low.

Of interest, a similar minimally invasive technique for pilonidal sinus treatment was designed by Meinero *et al.* (22): the Endoscopic Pilonidal Sinus Treatment (E.P.Si.T.). Their experience was based on 11 consecutive patients and obtained good preliminary results.

Although the mechanism of treatment is similar to the sinusectomy (19,20), the video-assisted technique benefits from a magnified view by the endoscope that allows the identification of the sinus borders, its lateral tracks, if present, and the presence of hair and debris inclusions in the cavity. According to this technique, infection and recurrence should be avoided by destroying all sinus cavities, the lateral tracks when present and by removing hair and debris. Furthermore, the small scar (5 mm wide and 2 mm

deep) caused by this technique (that heals by secondary intention) fastens the healing, allowing rapid return to work and an optimal aesthetic results. However it is important to highlight that, up to now, there was no any comparative study between sinusectomy and endoscopic treatment. Thus it is not possible to give any conclusion about the superiority/non inferiority of endoscopic sinusectomy,

Thereafter, Chia *et al.* (23) obtained good results of the endoscopic treatment, on 9 consecutive patients; Meinero *et al.* (24), in a multicenter experience, on 250 patients, demonstrated that the procedure is a safe and effective technique for treating pilonidal sinus. In fact, compared to other more invasive techniques, it provides better short- and long-term outcomes. Giarratano *et al.* (26) demonstrated that E.P.Si.T. is an uneventful procedure, with good aesthetic results and a low recurrence rate. Gecim *et al.* (27) combined a crystalized phenol treatment with E.P.Si.T., with good results and no recurrences, but consisted of a relatively small number of patients.

Minimally invasive technique was performed in acute disease too: Javed *et al.* (28) compared traditional incision and drainage with endoscopic treatment for pilonidal abscess, concluding that endoscopic approach is associated with reduced post-operative morbidity without compromising the adequacy of abscess drainage. Also Jain *et al.* (29) reported their experience of minimally invasive endoscopic technique in the acute disease, with encouraging results about postoperative morbidity, recurrance rate and wound healing.

Milone M. *et al.* (21) published the first randomized clinical trial comparing the minimally invasive treatment with the validated off-midline intervention.

The results demonstrate that the new technique is more effective than the traditional one in terms of rapid return to normal activity (time off work) and in pain management after surgery. Additionally, patients demonstrate high satisfaction levels and aesthetic appearance is satisfactory.

It is worth mentioning that, according to Milone *et al.*, this treatment could be an effective and feasible treatment for pilonidal sinus, being connected to a similar rate of postoperative complications compared with the conventional treatment. Moreover, in the minimally invasive group fewer infections were recorded alongside a similar recurrence rate was registered, providing evidence of the non-inferiority of the minimally invasive treatment compared with traditional off-midline closure.

On the other hand, it is very important to highlight that the recurrence rate, obtained by current literature, deserves further evaluation over a longer term period. In fact, based on the short-term follow-up, used to analyze clinical outcomes, it is impossible to draw definitive conclusions about the recurrence rate of the minimally invasive technique. Furthermore, further RCT comparing endoscopic treatment with sinusotomy or off-midline procedure are needed to confirm superiority/non-inferiority of this endoscopic procedure.

Definition of minimally invasive treatment

This new approach designed simultaneously and independently by Milone (21) and Meinero (22) had many names that should not confounded the clinicians involved in the disease's management.

VAAPS, EPSiT, video assisted treatment, endoscopic sinusectomy, etc. have to be considered all synonymous of a new technique. There is only one concept; to treat pilonidal sinus by a minimally invasive technique.

Conclusions

The foundation for the birth of a new era of pilonidal sinus treatment has been laid. Our new technique provides outstanding advantages: no surgical wounds on the buttocks, high patients' compliance due to minimal pain and wound care, and the technique facilitates immediate return to work and to daily activities.

It is the time to give patients this treatment opportunity in daily practice. It is the time to talk about the endoscopic treatment of pilonidal sinus. It is the time to thoroughly study every fold of this procedure in the effort of identifying indication, contraindications, advantages and disadvantages of a new weapon available against this tricky disease.

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