DOI: 10.46768/racp.v32i03.79

Pilonidal Cyst Resolution Using H-Flap Technique

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ABSTRACT
IIntroduction: *The pilonidal cyst, a lesion filled with hair at the level of the coccyx, occurs in 26/100,000 inhabitants, mostly between 15 and 30 years of age.*
Objective: *To describe the performance of the H-flap technique for the treatment of pilonidal cyst.*
Design: Prospective descriptive observational study.
Material and methods: *All patients with mass or swelling at the sacral area, with a diagnosis of pilonidal cyst, treated with the H-flap technique between April 2017 and April 2018, at the Hospital de Trauma y Emergencias Dr. Federico Abete were included. Those with infections in the surgical area or recurrences from previous surgeries were excluded. The follow-up was 12 months.*
Results: *Fifteen patients underwent the H-flap technique. It had an excellent acceptance by the patients. The complication rate was 13.3% and recurrence was null.*
Conclusion: *The H-flap is another therapeutic alternative for the resolution of the pilonidal cyst, with good tolerance by the patient and satisfactory results.*

Key words: *Pilonidal cyst; Sacrococcygeal cyst; H flap; Treatment; Surgery; Recurrence*

INTRODUCTION

The pilonidal cyst is a disease known since 1833, described by Herbert Mayo as a cyst filled with hair at the level of the coccyx.[1] In 1880 Richard Manning Hodges coined the term pilonidal cyst derived from the Latin words pilus (hair) and nidus (nest), for its resemblance to a nest of hairs.[2]

Its frequency is approximately 26/100,000 inhabitants and the male/female ratio is 2:1,[3,4] although in some series it reaches 5:1.[5] It occurs more frequently between the 15 and 30 years of age.[6]

There are two pathophysiological theories about its formation. The first attributes the pilonidal cyst to a congenital primitive ectodermal remnant.[1,6] The second and most accepted indicates that it is acquired[7] and related to microtrauma. The rubbing or crushing of the hair follicle induces a subcutaneous reaction with the formation of a cavity surrounded by granulation tissue product of the growth of one or more hair strands.[6]

In 1992 Karydakis[8] indicated three important factors in pathogenesis: hair, friction and skin susceptibility.

Some of the risk factors that are usually related to this pathology are: hirsutism, obesity, deep intergluteal groove, epidermal damage and family history, among others.[9]

The clinical presentation can range from an asymptomatic process to recurrent abscess formation or chronic inflammation with purulent or serosanguinous discharge through fistulous tracts, which cause a variable degree of discomfort.[4] In approximately 50% of patients, it manifests after puberty as an acute abscess.[10] Regardless of the form of presentation, the pilonidal cyst is usually accompanied by one or more orifices, the majority in the midline,[11] although there may be secondary paths with orifices located lateral or distant from the midline.[12]

Although there are multiple treatments for pilonidal cyst, from non-operative to surgical, the evidence suggests that the gold standard is surgery, with en bloc resection of the cyst and primary or secondary closure.[7]

This article will address surgical management with primary closure. This can be done with the Karydakis and Limberg flap techniques. An H-flap, a technique used in plastic surgery which is part of the randomly vascularized local advancement flaps, can also be used. It has a dermocutaneous component, the conjugation of two U-shaped flaps, which would classify it as bipediculate.[13]

The Karydakis flap technique consists of midline excision of the pilonidal sinus followed by coverage with a fasciocutaneous tissue that is sutured laterally to the sacrococcygeal fascia to avoid midline tension.[8,11,14] The Limberg flap technique consists of the en bloc resection of the pilonidal cyst in the shape of a rhombus and the displacement of a flap with the same rhomboid shape obliquely, with little tension by avoiding the midline, allowing rapid healing.[14-16] The objective of this study is to evaluate the usefulness of the H-flap technique in patients with sacrococcygeal disease.

The author declare the absence of conflicts of interest.
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Received: *September 2020.* ***Accepted:*** *April 2021.*

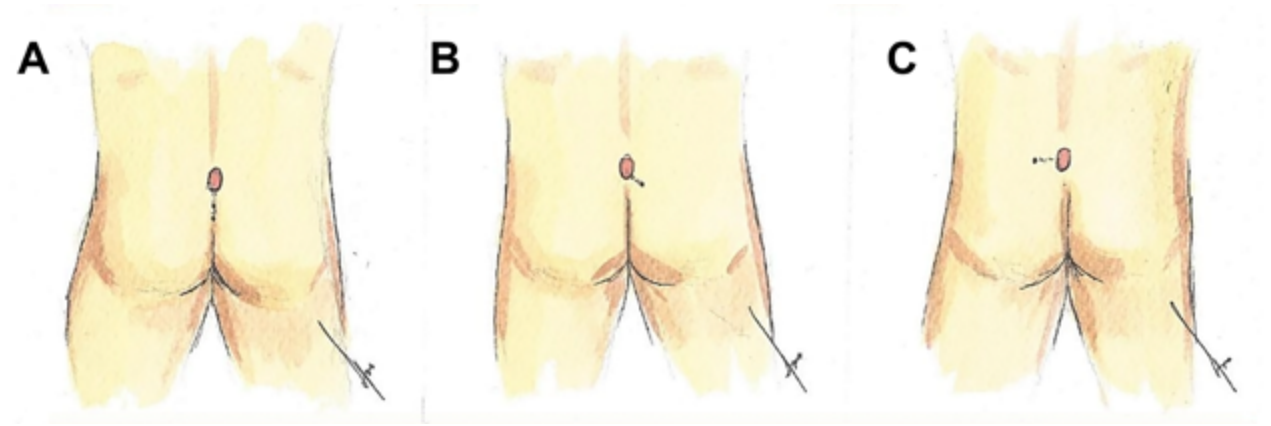

Figure 1: a) Orifice and medial fistulous tract. b) Orifice and lateral medial fistulous path. c) Orifice and lateral fistulous path.

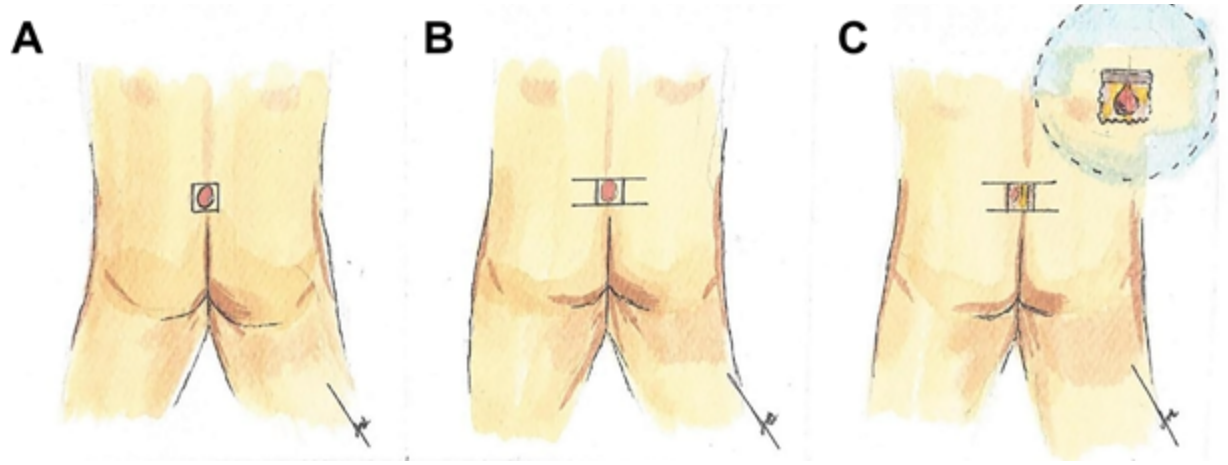

Figure 2: a) Pilonidal cyst. b) Design of the H-plasty c) Resection of the lesion.

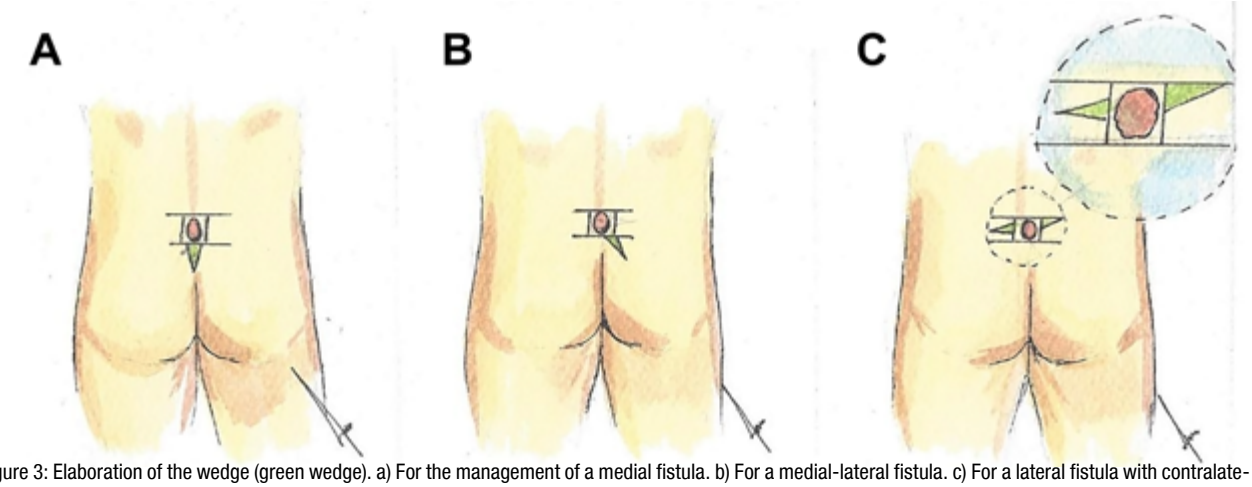

Figure 3: Elaboration of the wedge (green wedge). a) For the management of a medial fistula. b) For a medial-lateral fistula. c) For a lateral fistula with contralateral wedge compensation.

MATERIAL AND METHODS

An observational, descriptive study, with prospective data collection was carried out on 15 patients with sacrococcygeal mass or swelling treated with the H-flap technique between April 2017 and April 2018, in the general surgery service of the Hospital de Trauma and Emergencies Dr. Federico Abete, Malvinas Argentinas. The follow-up was 12 months. The surgeon was the same in all the procedures in order to reduce variations in the surgical technique. All the specimens obtained were sent to the pathology service. The patients agreed to participate in the study by signing the written informed consent. Those with signs of cellulitis, or with recurrences after having been treated

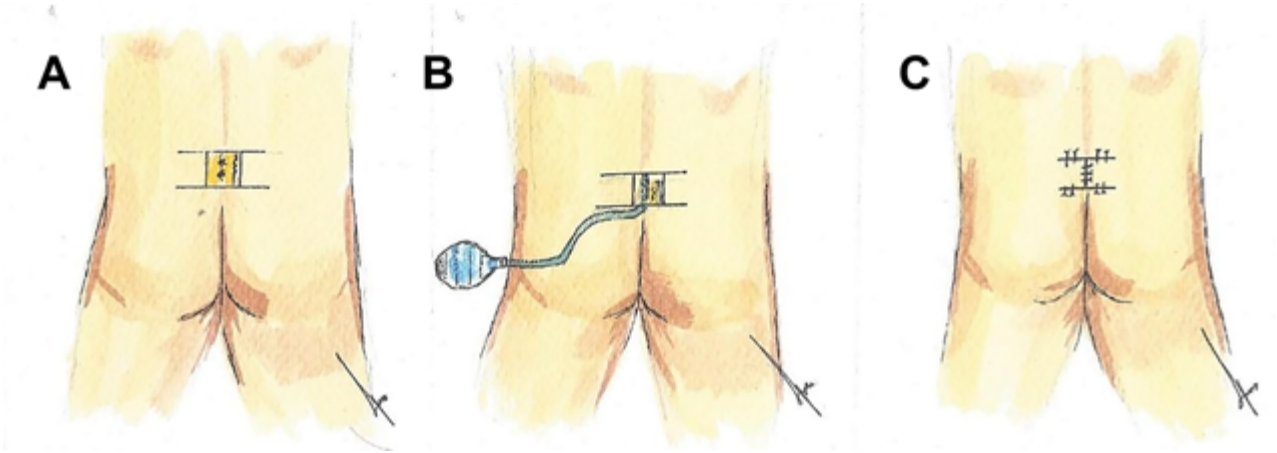

Figure 4: a) Closure of the subcutaneous cellular tissue. b) Placement of the subcutaneous drain. c) Procedure completed.

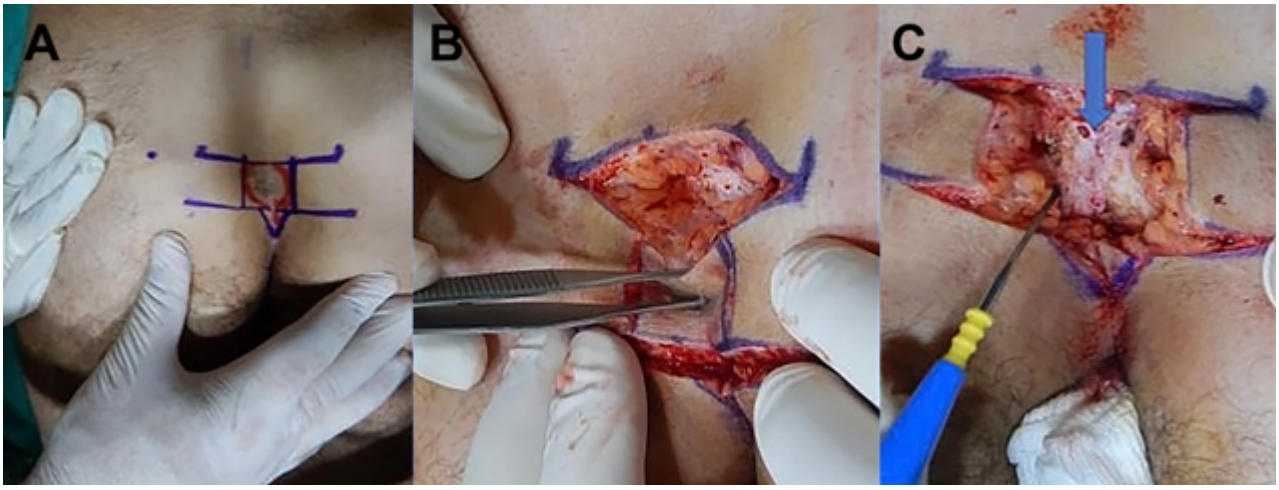

Figure 5: Medial fistula. a) Marking and delimitation of the H-flap. b) Dissection with scalpel. c) Selective coagulation.

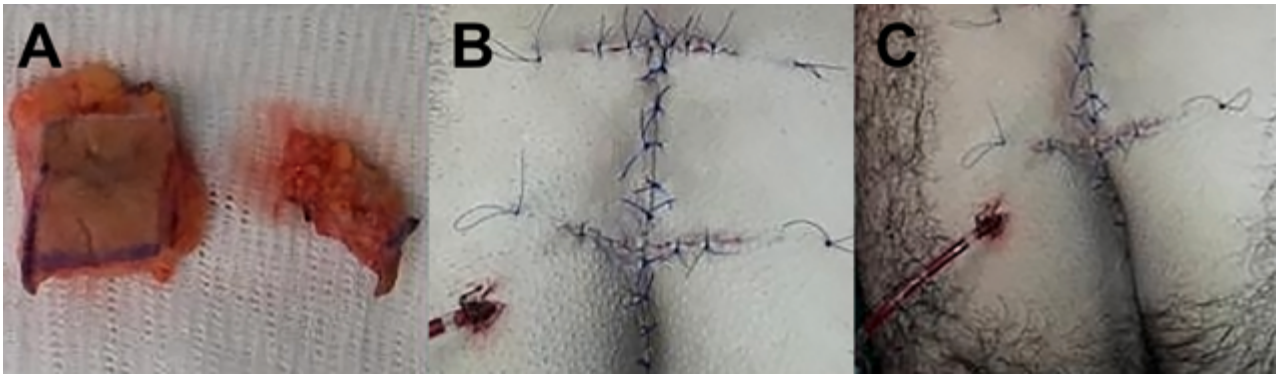

Figure 6: Medial fistula. a) Specimens obtained from the resection, one cubical and the other pyramidal. b) Suture completed and drainage attached to the skin.

with other open or closed techniques, were excluded.

Four demographic variables were analyzed: age, gender, body mass index (BMI) and family history. The surgical risk was assessed by the anesthesiology service by classifying the functional status of patients according to the American Society of Anesthesiology score (ASA). The degree of hirsutism was determined by the dermatology service.

The performance of the technique was evaluated taking into account the surgical time, complications and recurrence. Postoperative pain was determined by the Visual Analogue Scale (VAS). The presence of fistulas was evaluated with physical examination.

Follow-up was carried out at 5, 15 and 30 days and 12 months. At the last follow-up, ultrasonography was performed to determine the distance from the skin to the

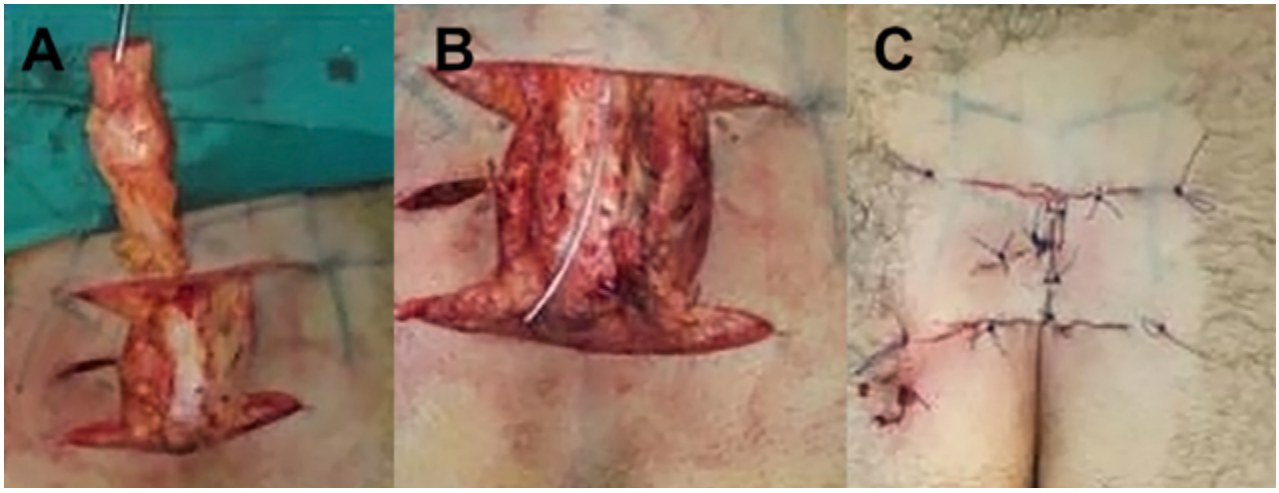

Figure 7: Lateral fistula. a) Separation of the specimen from the sacral fascia. b) Lateral wedge resection (arrow) and drain placement. c) Wound closure finished.

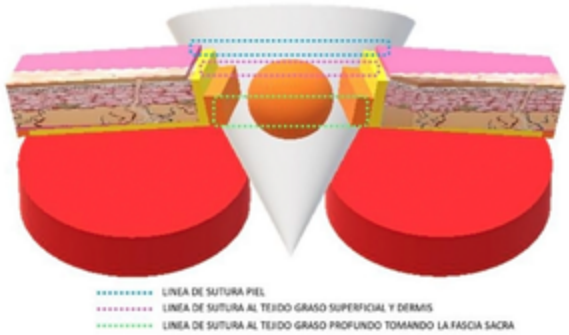

Figure 8: Scheme showing the closure by planes of the H-flap technique.

sacral fascia. This ultrasound was performed by the same operator.

For statistical analysis of the variables, the Epinfo® V 7.2 program was used.

Surgical technique

With the patient in the prone position, the cyst and the presence of fistulous orifices and their direction are identified and characterized (Fig. 1). Marking is carried out until the edges of the lesion are delimited in a square (Fig. 2 a). Subsequently, taking the vertical lines of the square as the axis, the upper and lower horizontal lines are enlarged up to twice their length, to form an H in a horizontal position (Fig. 2 b). Section with scalpel is performed, only using electrocautery for hemostasis. Once the cubical repairs are reached up to the sacral fascia, the lesion is completely excised with electrocautery (Fig. 2 c). For the management of fistulous tracts, some technical variations using wedges can be made (Fig. 3). Subsequently, the flaps are advanced and the primary closure of the wound is carried out by planes, suturing the superficial and deep adipose tissue separately with absorbable suture and the skin with monofilament nonabsorbable suture. The placement of a drain is evaluated for 3 to 5 days in the presence of: 1) Abscessed cyst. 2) Need for resection of fistulous tracts. 3) Obesity (Fig. 4). Discharge is granted a few hours after surgery, with indications of cephalexin and ibuprofen or paracetamol for 5 days.

Next, the use of this technique in 3 patients is described. *Case 1:* medial fistula. Preparation, marking and delimi-

TABLE 1: CHARACTERISTICS OF THE 15 PATIENTS UNDERGOING H-PLASTY.

Age: years, mean ± SD (range)	19.1 ± 8.2 (20-46)
Gender, M / F	11/4
BMI. mean ± SD (range)	30.1 ± 5.2 (22.8-40.3)
Duration of illness: months, mean ± SD (range)	53.8 ± 62 (1-240)
Family history	1
Clinical presentation, n (%)	
Abscess	4 (26.7)
Painful mass	2 (13.3)
Chronic suppuration	9 (60)
Hirsutism, n (%)	
Mild	5 (33.3)
Moderate	7 (46.7)
Severe	2 (13.3)
Hairless	1 (6.7)
Drainage history, n (%)	7 (46.7)
ASA n (%)	
I	14 (93.3)
II	1 (6.7)

BMI: Body Mass Index. ASA: American Society of Anesthesiology Classification of functional status.

tation of the H-flap is performed (Fig. 5 a). Dissection is performed with scalpel to obtain more linear edges and facilitate closure (Fig. 5 b). In this procedure, the electrocautery is only used for selective electrocoagulation (Fig. 5 c).

Case 2: medial fistula. Completion of surgery. The drainage fixed to the skin is evident (Fig. 6).

Case 3: lateral fistula. Management of a lateral fistula and separation of the specimen from the sacral fascia are performed. The lateral wedge resection (Fig. 7 a) and the subsequent placement of the drain (Fig. 7 b) are shown.

In Fig. 8 the suture planes of the technique can be seen.

RESULTS

The characteristics of the patients are detailed in Table 1. They had an average age of 19.1 years and 73.3% were men. Some degree of overweight (BMI> 25) was observed in 3 patients (20%) and obesity (BMI> 30) in 7 (46.7%). Like the consultation to the surgery service, the resolution of this pathology was delayed by an average of 53.8 months. This could have relationship with the most frequent type of presentation, which was chronic suppuration (60%). On the other hand, 46.7% of patients came to consultation with a painful mass, which was drained and treated with oral antibiotics without referral to the surgery service for its definitive management. Almost all patients were low risk preoperatively. Only one had a history of a relative with a pilonidal cyst.

Fistulas were present in 47% of patients, the medial location being the most frequent. Two types of anesthesia, local and spinal, were used for the surgery. Drains were used in 67% of the patients and the operative time averaged 64.3 minutes (Table 2).

When evaluating postoperative pain, it was observed that it is a very well tolerated technique with no cases of chronic pain. There was 1 early and 1 late complication with resolution without the need for reoperation. With rapid return to work activities, in an average of 13.5 days (Table 2).

The histopathology anatomy informed pilonidal cyst in 86.7% (13/15) of cases, while the rest were reported as inflammatory process.

In the follow-up at 12 months, no recurrences were observed in the clinical and ultrasonographic evaluation, with an average distance from the skin to the sacral fascia of 39.3 mm (Table 3). A case of hyperesthesia of the surgical site was presented due to a foreign-body granuloma by thread that was removed in the office with gentle traction of the suture. Later, the symptoms improved. The perception of the esthetic result of the scar by the patients was excellent in 60% and good in 33.7%, which makes it a technique with acceptance by the patient.

TABLE 2: INTRAOPERATIVE, AND IMMEDIATE POSTOPERATIVE DATA OF THE 15 PATIENTS.

Data	n (%)
Type of anesthesia	
Local	9 (60)
Spinal	6 (40)
Fistulas	7 (47)
Lateral	2 (28.6)
Medial	4 (57.1)
Mid-lateral	1 (14.3)
Use of drainage	10 (67)
Complications	2 (13.3)
Early: Hematoma	1 (6.7)
Late: Granuloma	1 (6.7)
Operative time: minutes, mean ± SD (range)	69.3 ± 21.6 (30-105)
Postoperative pain	
VAS day 1	
1	7 (46.7)
2	7 (46.7)
3	1 (6.7)
VAS day 1	
0	3 (20)
1	10 (66.7)
2	2 (13.3)
Chronic pain	0
Time of return to work activities: days. mean ± SD (range)	13.5 ± 5.2 (7-21)

VAS: Visual analog scale.

DISCUSSION

The use of a subcutaneous drainage is a controversial concept; there are some studies in the literature that show a reduction in complications, others an increase and others no difference with its use, as concluded from the German National Guide on the management of the pilonidal disease.[17] In our study, it was used in cases of abscessed cyst, obesity and the need for resection of a fistula.

Regarding overweight as a risk factor, it is found in the

TABLE 3: DATA EVALUATED IN THE 15 PATIENTS AT 12-MONTH FOLLOW-UP.

Data	n (%)
Recurrence	0
Ultrasound: distance from the skin to the sacral fascia: mm. mean ± SD (range)	39.3 ± 13.9 (22.7-77.8)
Altered skin sensitivity	
Hypoesthesia	4 (26.7)
Normal	2 (13.3)
Hyperesthesia	9 (60)
Perception of the esthetic result	
Bad	0
Regular	1 (6.7)
Good	5 (33.3)
Excellent	9 (60)

literature in 37% of the cases and obesity in 13%.[10] This differs from our series, where obesity was present in almost half of the patients. This may be related to the small sample size.

Regarding the recurrence rate at 12 months, a meta-analysis of the literature shows 0.2% for the Karydakis technique and 0.4% for the Limberg flap technique. But it is important to note that in this study the follow-up was 60 months and that the rate of recurrence increased over time, being 1.9% and 5.2%, respectively.[18] In the present study, with the H-plasty technique, no recurrences occurred, although this may also be limited to the number of the sample and the time of follow-up. Recurrence rates are usually lower in short-term follow-up[18] and surgeons may also assume that their relapses are lower. This explains the importance of long-term follow-up.[19]

The complication rate reported with the Karydakis technique is 8% and with the Limberg flap technique 0-6%.[11] In our series the 13.3% rate may be related to the learning curve and the sample size. As previously described, in our series complications were minor, 1 early hematoma and 1 late thread granuloma.

Patient satisfaction with our technique was important, but it should be taken into account that limiting resection due to cosmetic concerns could lead to a higher recurrence rate.[5]

CONCLUSION

Multiple closed surgical techniques are currently performed for sacrococcygeal pathology due to pilonidal cyst, with varying percentages of recurrence and complications. The H-flap presents an alternative for its management.

In this study, its implementation resulted in significant patient acceptance, a postoperative period with little pain and minimal complications. No recurrences were observed at 12 months.

The long term follow-up of this series and the expansion of the number of patients are necessary to carry out comparative studies with other techniques in the future.

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