

Modified Limberg's transposition flap for pilonidal sinus.

Long term follow up of 216 cases



Ann. Ital. Chir., 2007; 78: 227-231

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AIM OF THIS STUDY: *to report our results in a large series of patients with chronic pilonidal sinus (PS) at long term follow up.*

MATERIALS AND METHODS: *Two hundred sixteen patients underwent excision and rhomboid flap transposition (RFT) from 1986 to 2004 for PS, and followed for more than two years. Clinical presentation includes: pilonidal abscess treated by drainage (33%), chronic discharge (48%) and simple infected sinus (19%). Mean follow-up was 74,4 months (range: 24-96).*

RESULTS: *Minimal flap necrosis occurred in 5 pts (2.3%), post operative infection in 2 pts (0.9%), 4 pts (1.8%) had a seroma, 18 pts (8.3%) anesthesia or hypoesthesia on the upper portion of the flap. The mean hospitalization was 3.1 ± 0.30 days and return to work was 10.8 ± 2,4 days. Recurrences occurred in 5 pts (7.4%) in our initial 87 pts. Since we modified the technique no recurrences were seen.*

CONCLUSIONS: *The Limberg's technique is a very effective procedure for chronic or recurrent PS with a low complications rate, a short hospital stay, a rapid return to normal activities and a low recurrence rate. Moreover with the modified technique the wound healing and the rate of recurrences have shown a significant decrease.*

Key words: Long term follow up, Modified Limberg's technique, Pilonidal sinus.

Introduction

Many surgical methods have been suggested to treat pilonidal sinus (PS) but an optimal surgical method remains controversial because of high recurrence rates¹⁻³. PS is common and it affects young patients after puberty with a peak incidence at the age of 16-25 years⁴. Male:female ratio is 3:1 and it's rare after the age of 40 years^{5,6}.

The source of the disease is thought to be natal cleft and deep intergluteal sulcus⁶. The pilonidal sinus results from the penetration of short hair shafts through the skin, which ultimately leads to an acute or chronically infected site. The disease can be treated effectively by appropriate surgery⁷. Operations includes excision and healing by open granulation⁸ excision with marsupialization⁹, excision and primary closure¹⁰⁻¹¹, excision and repair by plasty procedure, including the Karydakias flap¹², the gluteus maximus musculocutaneous flap¹², the w-y advancement flap^{13,14}, z plasty flap^{15,16}, w plasty flap¹⁷ rhomboid

transposition flap¹⁸⁻²⁴, cleaning out of hairs or the Lord Millar operation²⁵⁻²⁷, Bascom's operation of pit excision and lateral drainage²⁸.

The aim of this study was to report our results in a large series of patients performing a modified Limberg's transposition flap.

Material and methods

We reviewed 216 patients who underwent excision and rhomboid flap transposition (RFT) from April 1986 to April 2004 for PS and followed for more than 2 years. One hundred ninety five (91%) were male from 18 to 33 years (mean age 24 years), 21 were female from 16 to 30 years (mean age 22 years). 164 (76 %) have one opening within the natal cleft, 32 (15%) have two or three openings, always along the midline, while 19% have previously been operated by excision with primary closure and have experienced recurrence 1-2 years after surgery. Swelling was the most frequent clinical manifestation (138 pts. 64%). Clinical presentation includes pilonidal abscess treated by drainage (71 pts. 33%), chronic discharge (103 pts. 48%) and simple infected sinus (41 pts. 19%).

Pervenuto in Redazione Ottobre 2006. Accettato per la pubblicazione Dicembre 2006.

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SURGICAL TECHNIQUE

RFT was never performed during a period of acute inflammation, but 175 patients (81%) had been treated before with antibiotics or had undergone incision and drainage of an abscess. General anesthesia was used in the first 86 patients (40%) in the remaining 130 (60%), saddle spinal anesthesia with 1 % hypertonic marcaine had been successfully employed.

With the patient in a prone jackknife position, a rhombus including the pilonidal sinus was marked. It was excised down to the presacral fascia in the midline and to gluteal fascia laterally. The main flap including skin and subcutaneous. Complete mobilization is essential to prevent tension. The wound was closed in two layers, a subcutaneous adsorbable suture (vycril 00) that incorporated a bite of gluteal fascia was followed by skin closure (silk or nylon stitches). Suction drainage was used and removed on the 2nd postoperative day (Fig. 1). Skin sutures were removed on the 7th or 8th postoperative day and the patients were discharged with instructions about personal hygiene and the necessity for repeated shaving of the surrounding skin. All patients were seen after 2 weeks.

After the first 87 operations we modified this flap reconstruction by tailoring the rhomboid excision asymmetrically, to place the lower pole of the flap 1-2 cm lateral to the inferior midline, as also described 28 (Fig. 2). We have also modified the top of the upper flap with a curvilinear margine to avoid necrosis of the top (Figs. 3-4).

POST-OPERATIVE CARE AND FOLLOW UP

The drain was removed after drainage decreased under 20 ml/day, generally on the second post-operative day, and the patients were discharged the same day. On the tenth p.o. day the sutures were removed. All the patients were seen after 2 weeks and after 1-3-6 and twelve months to inquire about their complaints and satisfaction with the treatment.

After the first year patients were contacted by phone and asked whether they had any problems. The last interview was done in April 2004. The mean follow up time was 5.4 years. The wound infection rate, complete healing time, time to return to work and recurrence rate were recorded.

Results (216 patients)

The mean follow-up time was 74.4 months (range 24-96 months). Minimal flap necrosis occurred in only 16 (7.4%) patients and no surgical or medical intervention was necessary. Post-operative infection developed in 6 patients (2.7%) which was drained through the margin of the flap. The opening healed within four weeks. 4 patients (1.8%) had a seroma, which healed with conventional measures. In 18 patients (8.3%) anesthesia or



Fig. 1: Limberg trasposition flap.



Fig. 2: Preparation of modified Limberg's technique.

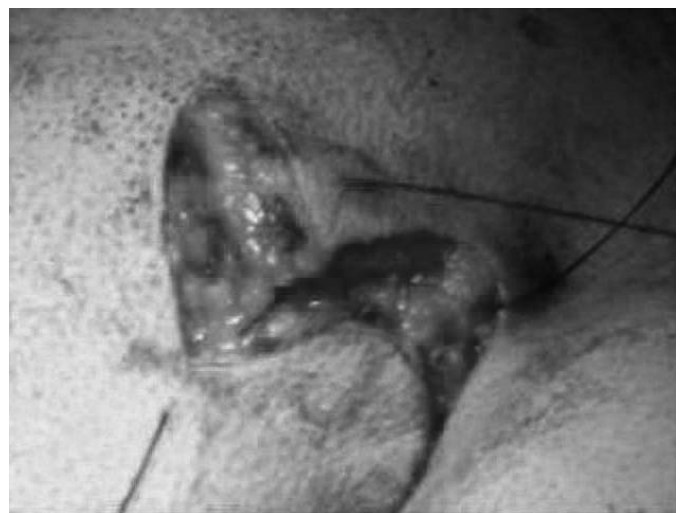


Fig. 3: Modified Limberg's trasposition flap.



Fig. 4: Modified Limberg's trasposition flap - final result.

ipoesthesia on the upper portion of the flap occurred which was permanent in 4 cases (1.8%). The mean hospitalization was 3.1 ± 0.30 days (range 1-8 days) and the mean time required until return to work activities was 10.8 ± 2.4 days (range 5-13). There have been 5 recurrences (2.3%), 3 of which occurred in the inferior midline and 2 at the end of upper part of the flap in our initial 87 patients (Table I). Since we modified the technique no recurrence was seen. Although we did not originally intend to form two groups for comparison, the recurrence rate differed significantly between the classic Limberg's flap group and the modified Limberg's group (Fischer's exact $\chi^2 = 0.0002$).

Discussion

Wound infection and recurrence are the biggest problems in the treatment of PS. Compared with other techniques, wound healing is fast and the recurrence rate is low. The problem with excision and primary closure is that the suture line tension sometimes occurs and, with quite frequent serous collection, this fact often leads to wound infection rates as high as 50% (29-30) and a

TABLE I - Results of 216 (87+129) patients.

Flap necrosis	16	7.4%
Post op infection	6	2.7%
Seroma	4	1.8%
Temporary ipoesthesia/anesthesia	18	8.3%
Permanent ipoesthesia/anesthesia	4	1.8%
Hospitalization	3.1 ± 0.3 days	
Return to work	10.8 ± 2.4 days	
Recurrence	5	2.3%

high recurrence rate of 11-28.5%³¹. This fact was confirmed in a recent meta-analysis which suggested that flaps techniques were more beneficial than simple closure in the midline³¹. Lay open techniques are less likely to recur than with primary closure, but healing times are prolonged³². Furthermore, the delayed healing of open packing and nursing of patient causes great discomfort for the patient and it's no cost-effective. Other flap procedures also have their advocates, although we have not found them as easy to perform as this operation. Most depend on avoidance of midline wounds but, cosmetically, the resulting distortion of natal cleft is not always acceptable by the patients. Furthermore, the z-plasty and the w-plasty techniques leave acute angles, which can lead to tip necrosis in up to 20% of cases, whereas Limberg's techniques has angles of 60° and 90° and in our experience any patient has not suffered from this problem 23, except 16 patients who had a minimal necrosis of the top of the flap treated without any surgical intervention. In our series there was no necrosis in the last 129 cases and wound infection developed only in 4 of 216 patients (1.8%). The hospitalization period is an important criterion in determining the success of a surgical technique in a localized disease. Hospitalization period for the different techniques have been reported as 0 to 15 day for incision and drainage³¹⁻³⁴, 29 days for incision and curettage³¹, 10 to 21 days for the excision- open packing technique⁶⁻³¹, 5 days for marsupialization and 8 to 21 days for z-plasty^{6,16}.

Despite the mean time for return to work was 10,1 days, the period for returning to their normal activities is short (mean time was 7 days). Preventing recurrences is may-or concern in the surgical treatment of PS. To decrease the rate of recurrence there are some details to follow performing the surgical operation³⁵. While the flap is prepared, the gluteal fascia must be left under the surface of flap, and this fascia must be sutured to the presacral fascia with multiple sutures. With this technique, no cavity that may cause recurrence will remain. Our successful results in terms of recurrence rate depends from the fact that the tip of the flap is rounded and the deep midline is eliminated. When the midline is lateralized or flattened, recurrences are less likely to occur than other primary closure methods that fail to reconstruct the intergluteal sulcus³⁶. Excision with reconstruction procedure such as w-y advancement flaps, z-plasty and w-plasty have been reported to yield low recurrence rates (0-9.5%, 1.6-10%, 0-16.7% respectively)^{17,20,25}. Low recurrence rate have been reported with this method^{2,21,22,37,38,39,40}. Only five recurrences were seen in our series (2.3%). The only weak point of the Limberg technique is that the lower pole of the flap stays within the intergluteal sulcus and the tip of the upper flap is acute. Thus we modified this flap reconstruction as described. These modifications eliminated the flap necrosis and recurrences that were always noticed to occur in our first 87 patients operated.

Conclusions

Results of our series confirm that the Limberg's technique is a very effective procedure for chronic or recurrent PS associated with a low complications rate, a short hospital stay, a faster return to normal activity, and a low recurrence rate. Moreover, with the modified technique the wound healing and the rate of recurrences have showed a significant decreasing.

Riassunto

OBIETTIVO DELLO STUDIO: Valutare i risultati ottenuti studiando un'ampia casistica di pazienti affetti da malattia pilonidale e sottoposti ad intervento di asportazione della lesione e ricostruzione con lembo di rotazione secondo la tecnica di Limberg modificata.

MATERIALI E METODI: Dal 1986 al 2004 sono stati trattati 216 pazienti ed il follow up medio è stato di 74,4 mesi. La casistica comprende pazienti con ascesso pilonidale drenato (33%), con infezione cronica (48%) e con semplice infiammazione (19%).

RISULTATI: Sono stati riportati 5 casi di necrosi minima del lembo (2.3%), 2 casi di infezione post-operatoria della ferita (0.9%), 4 casi di sieroma (1.8%) e 18 casi di ipo/anestesia della porzione terminale del lembo (8.3%). La durata media della degenza è stata di 3.1 ± 0.30 giorni e la ripresa delle normali attività lavorative è avvenuta in media in $10.8 \pm 2,4$ giorni. Sono state segnalate 5 recidive (7.4%) nella prima serie di 87 pazienti. Con le modifiche tecniche apportate alla metodica non sono state registrate recidive nei pazienti trattati.

CONCLUSIONI: Il trattamento della malattia pilonidale secondo la tecnica di Limberg modificata è efficace, permette di ridurre i tempi di ospedalizzazione e assicura un numero estremamente basso di recidive.

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