

BLOOD LOSS WITH THE MODIFIED KARYDAKIS FLAP TECHNIQUE IN THE TREATMENT OF PILONIDAL DISEASE

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ABSTRACT

Aims: Pilonidal disease (PD) is a debilitating illness that remains a challenging surgical condition. We aim to evaluate the relationship between blood loss and patient factors in those who underwent the Anderson Modified Karydakis Flap.

Methods: Consecutive patients who underwent the Anderson Modified Karydakis Flap from a prospective database were evaluated. Patient factors analyzed were age, gender, smoking status, body mass index, and American Society of Anesthesiologists Score. Patient's history of PD such as location of disease in relation to the navicular area, number of primary sinuses, secondary fistulas and dimensions of the excised area were also recorded.

Results: Twenty patients (Female =3, Male =17) were included in the study with a mean age of 25.7 years (range=16-42 years), The average amount of blood loss was 168g +/-48.3 g (95% CI). Patient factors associated with a greater operative blood loss included the presence of 4 or more pilonidal sinuses (mean blood loss in ≤ 3 sinuses 136g +/- 52g vs ≥ 4 sinuses 217g +/- 95g, 95% CI, p value 0.08), gender (mean blood loss in males 184g +/- 53g vs females 80g +/- 78g, 95% CI, p value 0.11), and secondary fistula formation (mean blood loss with secondary fistulas 188g +/- 69g vs without 109g +/-55g, 95% CI, p value 0.15).

Conclusion: Gender (males), the presence of more than 3 primary sinuses, and secondary fistula formation may predict a higher operative blood loss. This may have implications for staging the disease. Thinner patients with less excised tissue might bleed more. The reasons for these observations are unclear.

Keywords: Karydakis Flap; blood loss; pilonidal disease

INTRODUCTION

Pilonidal disease (PD) was first described by Mayo in 1833 as a cyst that contains hair [1]. It is a debilitating condition that typically affects young male adults. For decades surgery has remained the main treatment strategy. Karydakisin 1973 pioneered the procedure, which now carries his name, and has published the largest pilonidal series (6546 cases) [2, 3]. Kitchen and subsequently Anderson modified the procedure, which is considered easy to learn (10-20 cases) with high patient satisfaction and a low recurrence rate of 1-4% [4-6]. Multiple factors contribute to the effectiveness of any surgical procedure, one of which is blood loss. In this study, we aim to evaluate the relationship between blood loss and patient factors in those who underwent the Anderson modified Karydakis Flap [5].

METHODS

Consecutive patients who underwent the Anderson modified Karydakis Flap over a 12 month period (November 2015 to November 2016) were evaluated from a prospective database maintained by the principle surgeon. Operations were performed under non-protocolized prone general anaesthesia and patients were discharged on the day of the operation. All operations were performed with an advanced surgical trainee as the assistant. Patients were evaluated with respect with age, gender, smoking status, body mass index (BMI), and American Society of Anesthesiologists class (ASA). Patient's history of PD such as disease in relation to the navicular area, number of primary sinuses and secondary fistulae and histological dimensions of the excised sacrococcygeal area were also recorded.

Detailed description of patients and operative factors were recorded. Blood loss in milliliters was determined by weighing the sponges used until the flap had been raised (volume of blood is calculated by the weight of blood in grams multiplied by 1.06). None of the patients needed perioperative transfusion and patients do not undergo a Full Blood Count (FBC) pre or postoperatively. Analysis was performed using IBM SPSS Statistics 19 (Armonk, NY: IBM Corporation, 2010) and Microsoft Excel (Redmond, Washington: Microsoft, 2010) using the two-tailed Student-T test.

Operative Technique

After appropriate World Health Organization pre-operative safety checks, patients were administered intravenous antibiotics (cefazolin (Eli Lilly, New South Wales, Australia) and metronidazole (Pfizer, New South Wales, Australia)). The area of operation was shaved with clippers. The buttocks were taped to the sides of the operating table to improve exposure. Aqueous povidone-iodine 10% skin preparation was used. The area to be excised was marked (consisting of primary sinuses and nearby secondary fistulae) as shown in Figure 1. Excision of the affected area was performed with a scalpel. Bleeding was controlled with pressure. The flap was then raised with diathermy. Thorough haemostasis was achieved via monopolar diathermy. All sponges used to this step were weighed and the excess weight was recorded as the weight of blood loss. The wound was then washed out with Normal Saline.

Two layers of 2/0 polyglactin 910 interrupted sutures are used to approximate the flap. The tapes displacing the buttocks were released before the first layer was tied. Slowly absorbable 3/0 subcuticular suture was used for skin closure and dressing applied. The surgical scar is now lateralized from the midline with a flattened natal cleft.

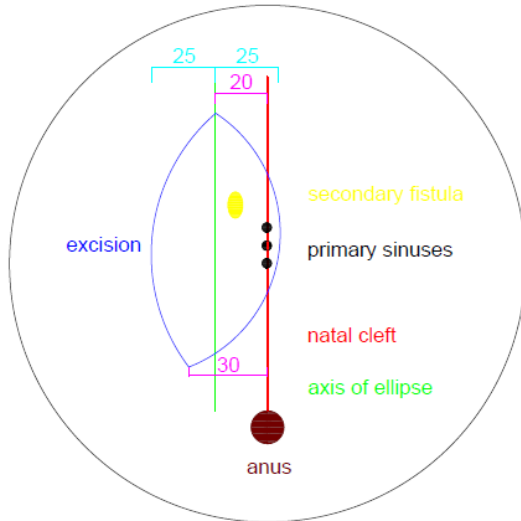


Figure 1: Illustration of the Anderson modified flap after initial modification by Kitchen ⁴. Measurements in millimeters.

RESULTS

Twenty patients (female 3, male 17) were included in the study with a mean age of 25.7 years (range 16-42 years). The mean volume of blood loss was 178ml ($168\text{g} \pm 48.3\text{g}$, 95% CI). The mean BMI was 28.5kg/m^2 . Histologically, the mean excised skin measured 114mm in length, 40mm in width with the depth of fat being 16mm. The mean number of primary sinuses was 3.

Possible factors associated with a greater operative blood loss included the presence of 4 or more midline sinuses (mean blood loss in ≤ 3 sinuses $136\text{g} \pm 52\text{g}$ vs ≥ 4 sinuses $217\text{g} \pm 95\text{g}$, 95% CI, $p = 0.08$), male gender (mean blood loss in males $184\text{g} \pm 53\text{g}$ vs females $80\text{g} \pm 78\text{g}$, 95% CI, $p = 0.11$), and the presence of a secondary fistula (mean blood loss with secondary fistula $188\text{g} \pm 69\text{g}$ vs without $109\text{g} \pm 55\text{g}$, 95% CI, $p = 0.15$). Detailed results are shown in Table 1.

Five patients did not attend their 3 weeks follow up appointment (mean blood loss $179\text{g} \pm 96\text{g}$). Four patients developed a minor superficial wound dehiscence which did not require a dressing or wound care or antibiotics (mean blood loss $221\text{g} \pm 81\text{g}$). The remaining 11 patients achieved primary wound healing (mean blood loss $149\text{g} \pm 66\text{g}$). There were no recurrences. The difference in blood loss between patients with primary wound healing and those with a superficial dehiscence was not statistically significant ($p=0.22$).

Risk factors	Variable	Number	Blood loss (ml)	P Value
Gender	Female	3	85	0.11
	Male	17	194	
Smoking status	Non-smoker	12	175	0.88
	Smoker	8	193	
BMI	< 30kg/m ²	14	134	0.25
	> 30kg/m ²	6	197	
ASA Class	ASA 1	11	210	0.16
	ASA 2	9	140	
Anatomical Factors				
Relationship to navicular area	Within	18	179	0.99
	Outside	2	178	
Number primary sinuses	1-3	12	143	0.08
	4-12	8	230	
Secondary fistula	Left + Right	4 + 11	199	0.15
	nil	5	116	
Histological Factors				
Length	< 115mm	12	152	0.20
	≥ 115mm	8	217	
Width	< 43mm	13	186	0.70
	≥ 43mm	7	164	
Depth	< 17mm	13	204	0.16
	≥ 17mm	7	130	

Table 1: Patient and operative factors

DISCUSSION

The mean volume of blood loss was 178ml (168g ± 48.3g). Male gender, the presence of 4 or more primary sinuses and secondary fistula formation may be risk factors for increased blood loss with the Anderson Modified Karydak is flap. This may be due to the fact that more tissue need to be excised however the amount of tissue excised was not related to blood loss. We could find no literature on blood loss with the Karydak is flap for comparison. Abcarian et.al stated that the major disadvantages of flap procedures are longer operative times, greater blood loss and complications related directly to the flaps including infection, loss of flap and scarring [7].

The mean blood loss for this series was 178 ml. For V-Y advancement flaps, approximately 120ml blood loss has been reported by Berkem (118ml) and Saray (117ml) in setting of primary pilonidal disease [8,9]. This increased to 240ml for recurrent PD as described by Khatri [10]. For multiple Z-plasties, the average blood loss was 50ml [11].

Pilonidal sinus excision with off midline flap closure achieves the lowest recurrence rate [12]. Earlier suggestion of no difference between advancing and rotation flaps with respect to recurrence has recently been disproven [13]. At long term follow up (10 years), Karydakias flap and Bascom cleft lift had the lowest recurrence rate (2.7%) compared to primary midline closure (32.0%) and Limberg flap (11.4%). Pit picking had a 5-year recurrence rate of 15.6% [13].

The strengths of this study are its prospective nature of data collection, weighing of all sponges used until stage of wound washout and consistency of technique by being performed or supervised by a single surgeon. The study was conducted within a short time frame limiting intrinsic modifications of technique. All procedures were performed after the operating surgeon's learning curve [6]. The study's limitations include a small sample size and non-standardized anesthetic techniques. Bleeding which occurred after the wound was washed out would not be included but this is estimated to be insignificant.

This study suggests patients with more extensive disease (number of primary sinuses and presence of a secondary fistula) experienced increased blood loss with the Anderson modified Karydakias flap. Other clinical and histological factors were not predictive of blood loss.

CONCLUSION

Blood loss with the Modified Karydakias flap is in the range reported for other flap procedures. In this study, we report that male gender, the presence of more than 3 primary sinuses, and secondary fistula formation may be associated with a higher operative blood loss. The reasons for these observations are not clear because the dimensions of tissue excised were not related to blood loss. Our findings may have implications for staging of the disease but will not change the process of obtaining informed consent.

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