



Comparative Study Between Outcomes of Conventional Versus Marsupialized Fistulotomy.

*Thesis submitted for fulfillment of Master (MSC) degree in
General Surgery.*

By

Haitham Soliman ELsayed Omar. (M.B.B.,CH)

Supervised by:

Prof. Dr. Medhat Mahmoud Assem (M.D)

Professor of general surgery

Faculty of medicine

Cairo University.

Prof. Dr. Ahmed Farag Ahmed Farag (M.D)

Professor of general surgery

Faculty of medicine

Cairo University.

Dr.Ahmed Mohsen Elmahrouky (M.D)

Lecturer of general and vascular surgery

Faculty of medicine

Cairo University.

2012.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

الحمد لله الذي هدانا لهذا

Abstract

Purpose:

The aim of the study was to compare the outcome of patients underwent conventional fistulotomy for perianal fistulae(Lay open technique) versus fistulotomy with marsupialization.

Methods :

Twenty patients (20) with low,non recurrent perianal fistulae were randomly assigned as follow:

(1)- Ten (10) patients were randomized to the the lay open (LO) group in which minimal amount of perianal skin on both sides of the incised tract was excised.This was designed to prevent premature skin healing before granulation from the depth of the wound was completed.

(2)- Ten (10) patients were randomized to the marsupialization group (MS) group in which the anoderm and the skin at the wound edges were sutured to the sides of the laid open fistula tract with interrupted **Vicryl 2/0**.

-The patients in both groups were not aware of the technique used at operation.

-Patients were followed up weeks after operation.The measured outcomes include:

1-Operative time

2-postoperative blood loss

3-Postoperative pain course.

4-Wound healing duration.

5-Wound infection.

6-post operative hospital stay.

7-Shape of the scar.

Results:

There was high statistical difference between marsupialization technique after fistulotomy and conventional fistulotomy regarding wound healing duration, postoperative pain, postoperative blood loss, wound sepsis, scar shape and postoperative hospital stay.

Regarding postoperative pain, there was no difference shown in pain after 1 week while there was a significant difference in 1st and 2nd day.

Conclusion:

The study shows that marsupialization of perianal fistulae is superior to the conventional fistulotomy regarding wound healing duration, postoperative pain and blood loss, scar shape, wound infection and post operative hospital stay.

Keywords:

***Fistulotomy-Marsupialization-postoperative pain-
Perianal fistula-scar shape-granulation.***

ACKNOWLEDGEMENT

First of all, all thanks to ALLAH who aided me to bring forth this thesis to light and arranged me to encounter those fatherly supervisor professors..Peace and blessing upon messenger of ALLAH and whenever supports him.

I would like to express my appreciation and gratitude to all those who helped me in completion of this work.

*I would like to particularly extend my thanks to **Prof.Dr.Medhat Mahmoud Assem** professor of general surgery for his precious guidance, great encouragement and valuable advices.*

*My best appreciation to the figure which corresponds to paternity, charity and scientific attitude, **Prof.Dr.Ahmed Farag Ahmed** professor of general surgery for his sincere help and support throughout the study. Really, I am very proud of working under his leadership.*

*I would like also to express my gratitude to **Dr.Ahmed Mohsen Elmahrouky** lecturer of general and vascular surgery who is an example of coordination between guidance, supervision, kindness and extreme of knowledge. In deed, he is the pattern I am looking forward to simulate in my near future life in each and every aspect of his scientific attitude.*

*My special thanks and appreciation to my dear and loyal wife; **Shrouk Adel** (Dermatologist), who helps me a lot in my life and do everything just to make me happy. Thanks for her encouragement and support to me in the preparation of this work inspite of her duties and suffering in her pregnancy. To her and to our lovely coming daughter, I dedicate this work.*

Also, I don t forget to thank her parents ,who are also mine, for their continuous care, encouragement and support.

*Last but not least, I would like to thank my **father** and **mother** (God save them) and my family, especially my younger brother, for their patience, support and help without which ,the fulfillment of this work would not have been possible. I hope I can pay back a part of what they did and always do for me....*

Haitham Soliman.....

Contents

• <u>Acknowledgment</u>	
• <u>List of figures</u>	
• <u>List of photos</u>	
• <u>List of tables</u>	
• <u>List of abbreviations</u>	
• <u>Introduction and aim of the work</u>	1
• <u>Review of literature:</u>	
<u>Anatomy</u>	3
<u>Physiology</u>	18
<u>Pathology</u>	24
<u>Anal abscess</u>	28
<u>Fistula-in-ano</u>	35
<u>Diagnosis</u>	41
<u>Investigations</u>	43
<u>Treatment modalities for fistula</u>	48
• <u>Marsupilization Review</u>	61
• <u>Patients and methods</u>	69
• <u>Results</u>	73
• <u>Discussion</u>	89
• <u>Summary and Conclusion</u>	92
• <u>Case series</u>	94
• <u>References</u>	102
• <u>Arabic summary</u>	

List of Figures.

Fig.No	Title of figures	Page No.
1	Anatomic and surgical anal canal.	4
2	Muscular component of the anal canal.	5
3	Extrinsic muscles of the surgical anal canal.	6
4	M.R.I coronal oblique (a) endoanal (b) external coil.	7
5	The anorectal musculature.	8
6	Pelvic musculature.	9
7	The interior of the anal canal showing the rectal columns.	11
8	The arterial supply of the rectum and anal canal.	12
9	Venous drainage of the rectum and anal canal.	13
10	Lymphatic drainage of the anal canal.	13
11	Innervation of the rectum and anal canal.	15
12	Para anal and pararectal spaces(front view-A) and (lateral view-B).	16
13	Anal sensory receptors.	20
14	Angulation between the rectum and the anal canal(A) lateral view (B) antero posterior view.	23
15	Flutter valve mechanism.	23
16	Flap valve mechanism.	23
17	Cryptoglandular origin theory.	27
18	Pathways of anorectal infection in perianal spaces	28
19	Classification of anorectal abscess.	29
20	Drainge of perianal abscess.	31
21	Drainge of horseshoe perianal abscess.	32
22	Drainge of supralelevator abscess.	33
23	Parks classification of fistula-in-ano.	37
24	The four main types of perianal fistula.	37
25	Intersphincteric fistula and its subtypes.	38
26	Trans-sphincteric fistula(a)uncomplicated type.(b) high blind tract.	39
27	Suprasphincteric fistula(a)uncomplicated type.(b) high blind tract.	39
28	Extrasphincteric fistula.	40
29	Extrasphincteric fistula:secondary to anal fistula.	40
30	Goodsall s' rule.	42
31	David Henry Goodsall photo.	42
32	Fistulography film showing low perianal fistula.	44
33	Anal endosonogram without(a) and with(b) hydrogen peroxide.	46

Cont.List of Figures.

Fig.no	Title of figures	Page no.
34	Schematic of layers of rectal wall(a) and normal endorectal ultrasonography(b).	46
35	M.R.I scan for perianal abscess (a)and complex fistula in a patient with Chron s' disease(b).	47
36	Lay-open technique.	50
37	Seton repair.	51
38	Advancement rectal flap.	54
39	Bone marrow aspiration in stem cell therapy.	57
40	Simple intersphincteric fistula demonstrated with the prope and forceps.	64
41	Fistulotomy done with cutting diathermy.	64
42	Marsupilization of fistulotomy wound (a&b).	65
43	Final wound appearance after retractor removal.	66
44	Difference between lay-open and marsupilization.	67
45	Schematic difference between fistulotomy with marsupilization and fistulectomy.	68
46	Pie chart demonstrating gender distribution.	74
47	Bar chart demonstrating symptoms in both groups.	76
48	Bar chart demonstrating investigations in both groups.	79
49	Bar chart demonstrating classification of fistula in both groups.	80
50	Pie chart demonstrating presence of preceeding abscess and mode of evacuation	83
51	Bar chart demonstrating postoperative blood loss in both groups.	85
52	Bar chart demonstrating healing duration in weeks for both groups.	87
53	Line chart demonstrating postoperative pain duration in both groups.	88

List of photos.

Photo.No	Title of photo.	Page No.
1	Proping of a perianal fistula in a patient underwent marsupialization in the current study.	49
2	Postoperative photo for a patient underwent marsupialization (case 1) .	94
3	Follow up of the same patient (case 1) one week postoperatively.	95
4	Follow up of the same patient (case 1) three weeks postoperatively.	95
5	Follow up of the same patient (case 1) four weeks postoperatively.	96
6	Follow up of the same patient (case 1) 6 weeks postoperatively, showing complete healing.	96
7	Follow up of a patient (case 2) underwent conventional fistulotomy ,2 weeks postoperatively.	97
8	Follow up of the same patient (case2) 4 weeks postoperatively.	97
9	Follow up of a patient (case 3) underwent marsupialization, 2 weeks postoperatively.	98
10	Follow up of the same patient (case 3) 4 weeks postoperatively showing complete healing.	98
11	Follow up of the same patient (case 3) 7 weeks postoperatively showing complete healing.	99
12	Follow up of a patient (case 4) underwent conventional fistulotomy,3 weeks postoperatively.	100
13	Follow up of the same patient (case 4) 6 weeks postoperatively.	100
14	Follow up of the same patient (case 4) 10 weeks postoperatively showing complete healing.	101

List of tables.

Table no.	Table title.	Page no.
1	Gender distribution.	73
2	Chi-square tests for gender distribution.	73
3	Swelling in both groups .	74
4	Chi-square tests for swelling in both groups.	75
5	Pain in both groups.	75
6	Chi-square tests for pain in both groups.	76
7	Fistulogram in both groups.	77
8	Chi-square tests for fistulogram in both groups.	77
9	M.R.I fistulogram in both groups.	78
10	Chi-square tests for M.R.I fistulogram in both groups.	78
11	Classification of fistula in both groups.	79
12	Chi-square tests for classification of fistula in both groups.	80
13	Preceding perianal abscess in both groups.	81
14	Chi-square tests for preceding abscess in both groups.	81
15	Mode of abscess evacuation in both groups.	82
16	Chi-square tests for mode of abscess evacuation in both groups.	82
17	Post operative blood loss in both groups.	84
18	Chi-square tests for post operative blood loss in both groups.	84
19	Mean,median and standard deviation for both groups.	86
20	Mann-whitney test for both groups.	87
21	Test statistics for Mann-whitney test for both groups.	88

List of Abbreviations.

- AIDS:** Acquired immunodeficiency syndrome.
- ASCRS:** American Society of Colon and Rectal Surgeons.
- C.T:** Computed tomography.
- EAS:** External anal sphincter.
- HIV:** Human immunodeficiency virus.
- IAS:** internal anal sphincter.
- IBD:** Inflammatory bowel disease.
- L (...):** Lumbar root (...).
- LO group:** Lay open group.
- MHZ:** Mega hertz.
- mmHG:** mille meter Mercury.
- M.R.I:** Magnetic Resonance Imaging.
- MS group:** Marsupilization group.
- NSAIDS:** Non Steroidal Anti-Inflammatory Drugs.
- NSR:** Numerical Rating Scale.
- RAIR:** Recto Anal Inhibitory Reflex.
- RF:** Radiofrequency.
- S(..):** Sacral root.
- SSPS:** Statistical Package for the Social Science.
- VAS:** Visual Analog Scale.

INTRODUCTION

Anal abscesses and fistulas are a common surgical condition. Management of the majority of anal abscesses and fistulas is straightforward and is based on a sound knowledge of the anatomy of the anorectum and adherence to established surgical principles. **(Rickard M., 2005)**

In most centers of the world, the management of perianal fistula remains surgical although the evolving of a variety of newer methods of minimal invasive treatment which are likely to minimize the issues of operative complications and, at the same time, achieve higher cure rates

Lay open of the fistula tract (conventional fistulotomy) is commonly used procedure and still relied on by the majority of surgeons as the “gold standard” for treatment of fistula-in-ano. **(Rizzo JA, 2010- Malouf AJ., 2002)**. It can cure the fistula but this may involve prolonged wound healing, anal deformity and compromise of anal continence **(kronborg.O, 1985)**

For these reasons, several techniques have been proposed and introduced to the surgical practice to overcome these problems. One of these techniques is the marsupilization technique in which the wound edges are marsupilized to the laid open fistula tract leaving less raw unepithelialized tissues thereby, resulting in less postoperative blood loss, less postoperative pain, faster wound healing and decrease the deformity in the shape of the formed scar thus minimizing fecal incontinence.

Moreover, marsupilization is postulated to decrease recurrence of fistula after surgery as the sutured edges to the laid open tract allows long-term drainage and prevents premature closure of the skin before filling from the depth by healthy granulation tissue (i.e: allow healing by 2^{ty} intention) (***controlled healing***) thus, prevents the formation of another cavity (abscess) which may lead to recurrence of the fistula.

Aim of the study:

The present study is a randomized controlled trial aiming at comparing the lay open technique with the marsupilization technique regarding wound healing duration, post operative pain, post operative blood loss, post operative stay, recurrence and anal deformity post surgery.

Anatomy

Anal Canal Structure, Anus, and Anal Verge

The anal canal is anatomically peculiar and has a complex physiology, which accounts for its crucial role in continence and, in addition, its susceptibility to a variety of diseases. The anal canal is the terminal portion of the intestinal tract. It begins at the anorectal junction (the point passing through the levator ani muscles), is about 4 cm long, and terminates at the anal verge. The edge of the anal orifice, the anal verge or margin (anocutaneous line of **Hilton**), marks the lowermost edge of the anal canal and is sometimes the level of reference for measurements taken during sigmoidoscopy. Others favor the dentate line as a landmark because it is more precise (**Nivatvongs S, 1982 - Milligan ETC, 1934**)

The epithelium distal to the anal verge acquires hair follicles, glands, including apocrine glands, and other features of normal skin, and is the source of perianal hidradenitis suppurativa, inflammation of the apocrine glands (**Bruce G. wolff, 2007**).

Anatomic Versus Surgical Anal Canal

Two definitions are found describing the anal canal (Figure 1). The “anatomic” or “embryologic” anal canal is only 2.0 cm long, extending from the anal verge to the dentate line. The “surgical” or “functional” anal canal is longer, extending for approximately 4.0 cm (in men) from the anal verge to the anorectal ring (levator ani).