



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**HANAA ALY**



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكرو فيلم



# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



**HANAA ALY**



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**HANAA ALY**



# **The Effect of Mediolateral Episiotomy on Obstetric Anal Sphincter Injuries following Vaginal Delivery**

*Thesis*

Submitted for Partial Fulfilment of M.D. Degree  
in Obstetrics & Gynaecology

*Presented by*

***Khadiga Mostafa Hussein Hegab***

*M.B.B.Ch. (2011), M. Sc. (2016)*

*Faculty of Medicine, Ain Shams University*

*Assistant Lecturer in Obstetrics and Gynecology*

*Ain Shams Maternity University Hospital*

*Supervised by*

**Prof. Hisham Mohammed Fathy**

*Professor of Obstetrics and Gynecology*

*Faculty of Medicine, Ain Shams University*

**Prof. Haitham Abd EL-Mohsen Sabae**

*Assistant Professor of Obstetrics and Gynecology*

*Faculty of Medicine, Ain Shams University*

**Prof. Heba Abd EL-Basset Allam**

*Assistant Professor of Obstetrics and Gynecology*

*Faculty of Medicine, Ain Shams University*

*Faculty of Medicine*

*Ain Shams University*

**2021**

# Acknowledgments

*First and foremost, I feel always indebted to **Allah** the Most Beneficent and Merciful.*

*I wish to express my deepest thanks, gratitude and appreciation to **Prof. Wisam Mohammed Fathy**, Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

*Special thanks are due to **Prof. Haitham Abd EL-Mohsen Sabae**, Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his sincere efforts, fruitful encouragement.*

*I am deeply thankful to **Prof. Heba Abd EL-Basset Allam**, Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for her great help, outstanding support, active participation and guidance.*

*I would like to express my hearty thanks to all my family for their support till this work was completed.*

*Last but not least my sincere thanks and appreciation to all patients participated in this study.*

**Khadiga Mostafa Hussein Hegab**

# List of Contents

Title	Page No.
List of Tables.....	i
List of Figures .....	ii
List of Abbreviations.....	iv
Introduction .....	1
Aim of the Work .....	5
Review of Literature	
▪ Episiotomy .....	6
▪ Obstetric Anal sphincter Injuries (OASIS).....	28
▪ Transperineal Ultrasound .....	50
Subjects and Methods.....	62
Results.....	72
Discussion .....	87
Summary and Conclusion .....	93
Recommendations .....	95
References .....	96
Appendix	
▪ Appendix 1 .....	119
▪ Appendix 2 .....	122
▪ Appendix 3 .....	123
Arabic Summary	

# List of Tables

Table No.	Title	Page No.
<b>Tables of Review</b>		
<b>Table I:</b>	Complications of episiotomy .....	26
<b>Table II:</b>	Classification of perineal tears .....	31
<b>Table III:</b>	Risk factors for obstetric anal sphincter injury ...	35
<b>Table IV:</b>	Complications of OASIS.....	45
<b>Table V:</b>	Classification of perineal tears .....	65
<b>Tables of Results</b>		
<b>Table 1:</b>	Maternal, fetal and neonatal characteristics among the studied groups.....	75
<b>Table 2:</b>	Perineal tear among the studied groups .....	76
<b>Table 3:</b>	Perineal tear grade in cases with perineal tear among the studied groups .....	78
<b>Table 4:</b>	OASIS among the studied groups .....	79
<b>Table 5:</b>	Comparison according to final episiotomy status regarding maternal characteristics.....	80
<b>Table 6:</b>	Episiotomy angle (degree) among the studied groups .....	82
<b>Table 7:</b>	Comparison according to final episiotomy status regarding perineal tear.....	83
<b>Table 8:</b>	Comparison according to final episiotomy status regarding perineal tear grade .....	84
<b>Table 9:</b>	Multi-Regression analysis of the Dependent Variable in women who sustained an OASIS .....	85
<b>Table 10:</b>	Calculated Relative Risk Ratio (RRR): (episiotomy versus no episiotomy).....	86

# List of Figures

Fig. No.	Title	Page No.
<b>Figures of Review</b>		
<b>Figure I:</b>	Anatomical and surface borders of the female perineum .....	7
<b>Figure II:</b>	Contents of female perineum .....	10
<b>Figure III:</b>	Some of the muscles that share in the perineal body.....	11
<b>Figure IV:</b>	Neurovascular supply of the perineum.....	12
<b>Figure V:</b>	The Pudendal nerve origin, course and branches .....	12
<b>Figure VI:</b>	Diagrammatic representation of the anal sphincters.....	13
<b>Figure VII:</b>	Types of Episiotomy.....	17
<b>Figure VIII:</b>	Classification of perineal tears.....	32
<b>Figure IX:</b>	Episcissors-60™.....	37
<b>Figure X:</b>	(A) Third degree tear affecting the anal sphincter; (B) fourth degree tear extending to the anal mucosa.....	42
<b>Figure XI:</b>	(A) End-to-end; (B) overlap technique; (C) IAS repair.....	43
<b>Figure XII:</b>	Endo-anal ultrasound left .....	52
<b>Figure XIII:</b>	The technique of transperineal ultrasound examination .....	56
<b>Figure XIV:</b>	Scanning the sphincter in the transverse plane .....	57
<b>Figure XV:</b>	(a) The normal anatomy visible on a median sagittal section of the lower rectum and the anal sphincter. (b) Line drawing highlighting the structures seen on the scan.....	58
<b>Figure XVI:</b>	The normal anal sphincter unit .....	59

# List of Figures *cont...*

Fig. No.	Title	Page No.
<b>Figure XVII:</b>	Ultrasound imaging of anal sphincter injury, indicating 'half moon' sign.....	60
<b>Figure XVIII:</b>	Patient with a third-degree anal sphincter laceration at the time of her first delivery .....	60
<b>Figure XIX:</b>	Patient with fecal incontinence resulting from a fourth-degree sphincter tear, which happened during vaginal delivery.....	61

## Figures of Results

<b>Figure 1:</b>	CONSORT 2010 Flow Diagram of the studied cases .....	72
<b>Figure 2:</b>	Perineal tear among the studied groups .....	77
<b>Figure 3:</b>	Unplanned episiotomy among no episiotomy group.....	77
<b>Figure 4:</b>	Perineal tear grade in cases with perineal tear among the studied groups .....	78
<b>Figure 5:</b>	OASIS among the studied groups.....	79
<b>Figure 6:</b>	Comparison according to final episiotomy status regarding second stage duration.....	81
<b>Figure 7:</b>	Comparison according to final episiotomy status regarding perineal tear .....	83
<b>Figure 8:</b>	Comparison according to final episiotomy status regarding perineal tear grade.....	84
<b>Figure 9:</b>	Calculated Relative Risk Ratio (RRR): (episiotomy versus no episiotomy) .....	86

# List of Abbreviations

Abb.	Full term
<b>2D US</b> .....	Two-dimensional ultrasound
<b>3D US</b> .....	Three-dimensional ultrasound
<b>ASC</b> .....	Anal Sphincter Complex
<b>ACOG</b> .....	The American College of Obstetricians and Gynecologists
<b>BMI</b> .....	Body Mass Index
<b>CTG</b> .....	Cardiotocography
<b>EAS</b> .....	External Anal Sphincter
<b>EAUS</b> .....	Endoanal Ultrasound
<b>IAS</b> .....	Internal Anal sphincter
<b>ITD</b> .....	Inter tuberos diameter
<b>JAMA</b> .....	The Journal of the American Medical Association
<b>MLE</b> .....	Medio-Lateral Episiotomy
<b>MRI</b> .....	Magnetic Resonance Imaging
<b>NICE</b> .....	National Institute for Health and Care Excellence
<b>OASIS</b> .....	Obstetric Anal Sphincter Injuries
<b>PB</b> .....	Perineal body
<b>PPH</b> .....	Postpartum haemorrhage
<b>RCOG</b> .....	Royal College of Obstetricians and Gynaecologists
<b>RRR</b> .....	Relative risk ratio
<b>SPA</b> .....	Sub-pubic arch
<b>TPUS</b> .....	Trans-Perineal Ultrasound
<b>US</b> .....	Ultrasound
<b>Vs</b> .....	Versus

## INTRODUCTION

In a woman's life, childbirth is the moment of greatest impact on the muscles of the pelvic floor and the perineal body. During vaginal delivery, many women develop trauma to the perineum, these tears can involve the perineal skin, the pelvic floor muscles, the external and internal anal sphincter muscles as well as the rectal mucosa (*Walsh and Grivell, 2015*).

The probability of this injury depends on the type of delivery; its association with forceps delivery is well established (*Garriga et al., 2011; Krofta et al., 2009*).

Obstetrical anal sphincter injuries (OASIS) are a major risk factor for subsequent development of anal incontinence (*Huebner et al., 2013; LaCross et al., 2015; Ozyurt et al., 2015; Richter et al., 2015; Sultan et al., 1993*).

Obstetric anal sphincter injury (OASIS) is defined as trauma that includes third- and fourth-degree tears. They are associated with high rates of short and long-term consequences for women (*Pierce et al., 2015*).

The incidence of OASIS varies largely between countries and delivery units, 1.0-5.85% (*Hals et al., 2010*).

OASIS is still mostly diagnosed immediately after delivery by clinical examination of the perineum. This

examination is subjective, and studies showed that sphincter injuries are often missed clinically (*Andrews et al., 2006; Fletcher et al., 2003; Gupta et al., 2003*).

Clinical assessment of perineal tears can often be difficult due to multiple factors: poor lighting, difficulty identifying anatomy and maternal discomfort during examination. This can lead to a potential classification of an OASIS as second-degree perineal trauma (*Andrews et al., 2006*).

Mediolateral episiotomy (MLE), a surgical enlargement of the vaginal orifice by a mediolateral incision in the perineum during the last part of the second stage of labour, is often performed, in order to prevent OASIS (*Kalis et al., 2008*).

Nevertheless, studies have not clearly demonstrated the efficacy of episiotomy in the prevention of anal incontinence (*Hartmann et al., 2005*).

Most studies examining whether episiotomies prevent OASIS and/or anal incontinence did not account for episiotomy technique, which has been shown to be an important determinant in preventing sphincter injury (*Eogan et al., 2006*).

The angle of the episiotomy away from the midline has been proven to be crucial in reducing the incidence of OASIS (*Stedenfeldt et al., 2012*).

The National Institute for Health and Care Excellence (NICE) recommends an angle of 45–60 degrees from the midline (*NICE, 2007*).

Primary repair of OASIS has been shown to be associated with 63% evidence of a good outcome versus secondary repair where the result can decrease to be less than 50% continence (*Oliver et al., 2008*).

Primary diagnosis of an obstetric anal sphincter injury is important, as an unrepaired or defect anal sphincter muscle increases the risk and prevalence of anal incontinence (*Roos et al., 2010*).

Transperineal ultrasound (TPUS) is a more accurate and objective method to diagnose OASIS. It has been shown that ultrasound performed prior to repair of visible obstetric trauma could improve detection rates of OASIS and allow for improved surgical repair, reducing the morbidity suffered by women undergoing vaginal birth (*Andrews et al., 2006*).

Ultrasound has proven to be a reproducible technique in the interobserver studies published (*Dietz and Steensma, 2006*), especially when ultrasound tomography images are used (*Dietz, 2007*).

In our setting, episiotomy is performed relatively frequently in primigravidas, on the grounds that it protects the pelvic floor. However recently, papers published in the

literature argue for selective rather than systematic use of the procedure (*Carroli and Belizan, 2000*).

In general, the effect of episiotomy on the obstetric anal sphincter has not been properly understood.

The objective of our study is to determine whether mediolateral episiotomy reduces the incidence of OASIS diagnosed immediately postpartum aided by TPUS, with two main questions in mind:

Does episiotomy really protect against obstetric anal sphincter injury?

And do variables such as duration of the second stage of labour, maternal BMI, neonatal weight, and neonatal head circumference, exert an influence?

## AIM OF THE WORK

### The aim of the study

To evaluate the relationship between mediolateral episiotomy and obstetric anal sphincter injuries in primiparous using 2D transperineal ultrasound immediately after delivery to aid in diagnosing anal sphincter injuries.

### Research question

Does Medioloateral Episiotomy guard against Obstetric Anal Sphincter Injuries (OASIS) in primiparous ladies?

### Research hypothesis

*Null hypothesis.* Mediolateral episiotomy does not affect the incidence of Obstetric anal sphincter injuries in primiparous ladies undergoing vaginal delivery.