تشريح النتوء الحلمى للجمجمة بالإشارة إلى حاجز كورنر وتطبيقاته الإكلينيكية

رسالة مقدمة من الطبيبة/ رضوى ممدوح الصبان بكالوريوس الطب والجراحة

توطئة للحصول على درجة الماجستير في علم التشريح

تحت إشراف الأستاذ الدكتور/ كريمان محمد الجو هرى أستاذ ورئيس قسم التشريح علية الطب - جامعة عين شمس

الأستاذ الدكتور/ ابتسام أحمد بهى الدين أستاذ علم التشريح والأجنة على الله الطب – جامعة عين شمس

الأستاذ الدكتور/ محمد عبد العظيم البجيرمي أستاذ جراحة الأذن والأنف والحنجرة كلية الطب – جامعة عين شمس

كلية الطب جامعة عين شمس ٢٠٠٨

Anatomy of the mastoid process with reference to Körner's septum and its clinical applications

Thesis
Submitted for partial fulfillment of M.Sc. Degree in Anatomy

Presented by Radwa Mamdouh El-Sabban

M.B., B.Ch.
Faculty of Medicine – Ain Shams University

Under supervision of

Prof. Dr. Kariman Mohamed El-Gohary

Professor and Head of Anatomy Department Faculty of Medicine – Ain Shams University

Prof. Dr. Ibtisam Ahmed Bahei Eldin

Professor of Anatomy
Faculty of Medicine – Ain Shams University

Prof. Dr. Mohamed Abdel Azim El-Begermy

Professor of Otolaryngology
Faculty of Medicine – Ain Shams University

Faculty of Medicine Ain Shams University 2008

تشريح النتوء الحلمى للجمجمة بالإشارة إلى حاجز كورنر وتطبيقاته الإكلينيكية

رسالة مقدمة من الطبيبة/ رضوى ممدوح الصبان بكالوريوس الطب والجراحة

توطئة للحصول على درجة الماجستير في علم التشريح

تحت إشراف الأستاذ الدكتور/ كريمان محمد الجو هرى الستاذ ورئيس قسم التشريح علية الطب - جامعة عين شمس

الأستاذ الدكتور/ ابتسام أحمد بهى الدين أستاذ علم التشريح والأجنة على الله الطب – جامعة عين شمس

الأستاذ الدكتور/ محمد عبد العظيم البيجيرمي أستاذ جراحة الأذن والأنف والحنجرة كلية الطب – جامعة عين شمس

كلية الطب جامعة عين شمس ٢٠٠٦

Anatomy of the mastoid process with reference to Körner's septum and its clinical applications

Thesis
Submitted for partial fulfillment of M.Sc. Degree in Anatomy

Presented by Radwa Mamdouh El-Sabban

M.B., B.Ch.
Faculty of Medicine – Ain Shams University

Under supervision of

Prof. Dr. Kariman Mohamed El-Gohary

Professor and Head of Anatomy Department Faculty of Medicine – Ain Shams University

Prof. Dr. Ibtisam Ahmed Bahei Eldin

Professor of Anatomy
Faculty of Medicine – Ain Shams University

Prof. Dr. Mohamed Abdel Azim El-Begermy

Professor of Otolaryngology
Faculty of Medicine – Ain Shams University

Faculty of Medicine Ain Shams University 2006

بسم الله الرحمن الرحيم

صدق الله العظيم سورة النحل (۷۸)

Acknowledgment

I would like to express my gratefulness and respect to **Prof. Dr. Kariman Mohamed El-Gohary**, Professor and Head of Anatomy Department, Faculty of Medicine, Ain Shams University, for her supervision, valuable remarks and suggestions that helped me throughout the whole work.

I would like also to express my deep gratitude and sincere appreciation to **Prof. Dr. Ibtisam Ahmed Bahei Eldin**, Professor of Anatomy, Faculty of Medicine, Ain Shams University, for her kind guidance, constant supervision, encouragement and advice throughout the whole work.

My profound thanks and appreciation to **Prof. Dr.**Mohamed Abdel Azim El Begermy, Professor of Otolaryngology,
Faculty of Medicine, Ain Shams University for his endless
patience and guidance, starting from the main idea till reaching the
final goal. This work could not have reached its aim without his
support.

Away from supervision I wish to express my thanks to **Prof. Dr. Kamal Asaad Ibrahim**, Professor and Head of Anatomy Department, Faculty of Medicine, October 6 University, for his help and encouragement.

My deepest thanks and gratitude to my husband **Dr. Wael Shehata Mohamed**, Lecturer of Otolaryngology, Faculty of Medicine, October 6 University who stood beside me throughout the whole work giving me his support and guidance.

Finally I am grateful to my parents for their kind help and encouragement.

Contents

	Page
• Introduction	1
• Aim of the work	3
Review of Literature	4
- Development of the temporal bone	4
- Anatomy of the temporal bone	10
- Körner's (Petrosquamosal) septum.	22
Material and Methods.	31
• Results	35
 Discussion 	65
Summary and conclusion	73
• References	76
Arabic Summary.	

List of Figures

Photographs of mastoid bones	
Fig. 1: Macewen's triangle	33
Fig. 2: Lines of drilling.	34
Fig. 3: Superficial mastoid air cells.	39
Fig. 4: Removal of Körner's septum.	40
Fig. 5 : Partial Körner's septum in left mastoid process.	41
Fig. 6: Deep mastoid air cells.	42
Fig. 7: Retrosinus and mastoid tip air cells.	43
Fig. 8: True and false mastoid antrum.	44
Fig. 9: Boundaries of the mastoid cavity.	45
Fig. 10: Complete Körner's septum.	46
Fig. 11: Partial Körner's septum in the right mastoid	
process.	47
Fig. 12: Partial Körner's septum at the lower part of	
mastoid process.	48
Fig. 13: Attachments of Körner's septum to the	
mastoid process	49
Fig. 14: Mastoid tip air cells and digastric ridge.	50
Fig. 15: Körner's septum (cog) in the attic.	51
Fig. 16: Mastoid antrum.	52
Fig. 17: Skeletonization of the semicircular canals.	53
Fig. 18: Air cell tracks.	54

Photographs of CT scan temporal bones	
Fig. 19: Partial Körner's septum in the attic.	56
Fig. 20: Partial Körner's septum.	57
Fig. 21: Partial Körner's septum and sclerosed mastoid.	58
Fig. 22: Complete Körner's septum in an axial cut.	59
Fig. 23: Complete Körner's septum in a coronal cut.	
Fig. 24: Unilateral Partial Körner's septum in left	
pneumatized mastoid process and partial	
sclerosed right one.	61
Fig. 25: Partial Körner's septum and sclerosed	
superficial mastoid compartment.	62
Fig. 26: Bilateral pneumatized mastoid process with	
unilateral Körner's septum.	63
Fig. 27: Bilateral well pneumatized mastoid bones.	

Introduction

The mastoid antrum is an air-filled sinus within the mastoid process of the temporal bone that communicates with the middle ear cavity by the aditus and has mastoid air cells arising from its walls (*Anson and Donaldson*, 1992).

The junction of petrosal and squamosal bones may persist as a bony lamina (petrosquamosal) or septum (Körner's septum) (*Proctor et al., 1981*). The septum is not only a bony plate dividing the mastoid air cells at the level of the antrum into superficial and deep groups, but it also forms a lamina starting from the posterior aspect of the glenoid (mandibular) fossa to the mastoid apex (*Göksu et al., 1997*).

Körner (1926) was the first to point out the clinical significance of the septum and referred to the danger of mistaking an extensive septum as the medial wall of the mastoid process at surgery, thus leaving the deeper medial mastoid air cells unexplored. Although this problem is a generally understood by the majority of otologists, the anatomy of the septum and its association with the

petrosquamosal suture has been largely ignored (*Virapongse et al.*, 1986).

Körner's septum may give a false impression to otologists of opening the mastoid antrum during surgery and may hide cholesteatoma or cholesterol granuloma behind it (Shulman and Rock, 1972; El-Begermy et al., 2005).

Aim of the Work

This study was done to describe the features of the mastoid process with special reference to Körner's septum or petrosquamosal lamina. Its incidence, anatomical variations and attachments were recorded. Its clinical importance was also evaluated.

The aim of this work was achieved via cadavers dissection and radiological studies.