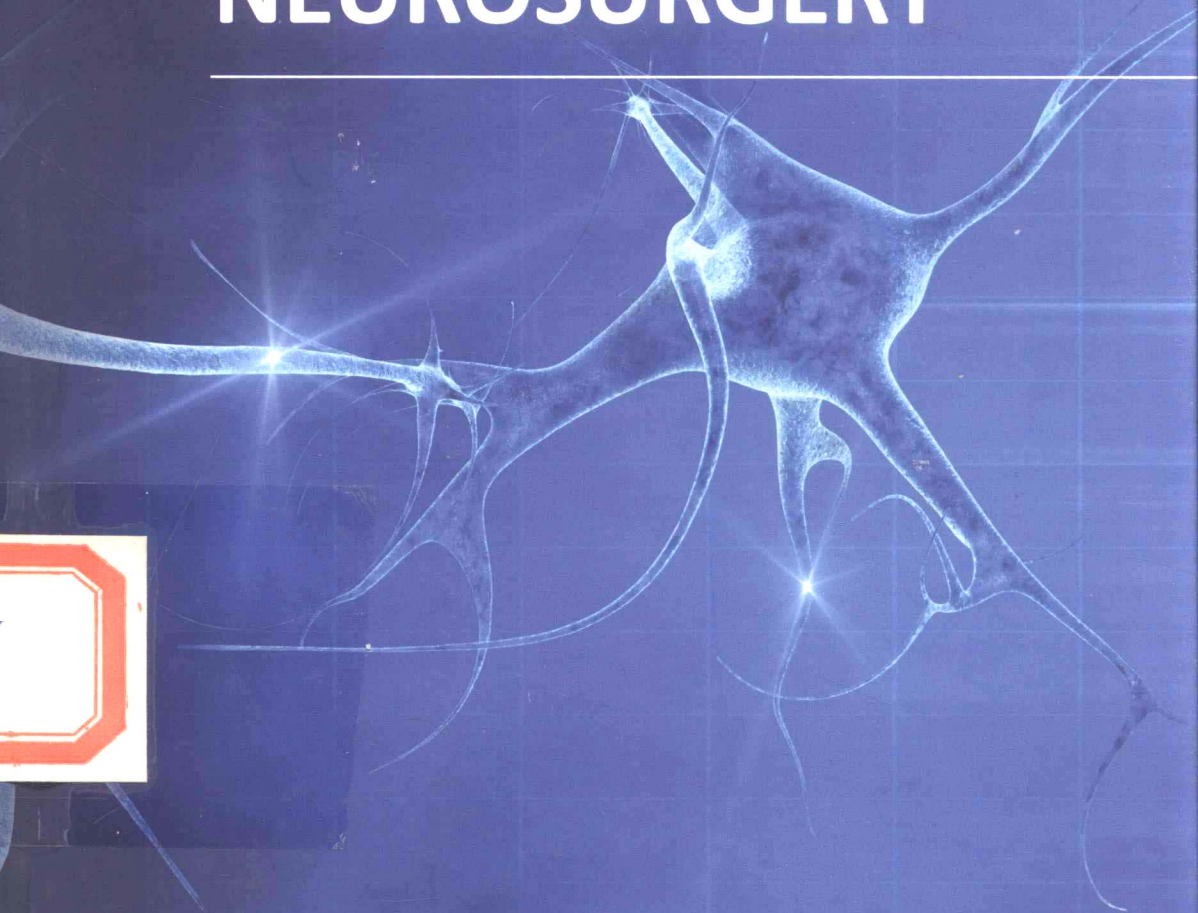

RESEARCH COLLECTION ON

EXPLICATIVE CASES OF CONTROVERSIAL ISSUES IN NEUROSURGERY



INTECH

RESEARCH COLLECTION ON EXPLICATIVE CASES OF CONTROVERSIAL ISSUES IN NEUROSURGERY



Research Collection on Explicative Cases Of Controversial Issues In Neurosurgery

<http://dx.doi.org/10.5772/58106>

Chapters from books edited by: **Francesco Signorelli**

Published by InTech

Janeza Trdine 9, 51000 Rijeka, Croatia

Edition 2014

Copyright © 2014 InTech

Individual chapters are under copyright of their author(s), and distributed under a Creative Commons license. The exact license terms for every individual chapter can be obtained from the Publisher.

Notice

Statements and opinions expressed in the chapters are these of the individual contributors and not necessarily those of the editors or publisher. No responsibility is accepted for the accuracy of information contained in the published chapters. The publisher assumes no responsibility for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained in the book.

Additional hard copies can be obtained from orders@intechopen.com

Research Collection on Explicative Cases Of Controversial Issues In Neurosurgery

p. cm.

ISBN 978-953-51-1534-2

Contents

Explicative Cases of Controversial Issues in Neurosurgery 9

Suboccipital Concentric Craniotomy as Variant for Posterior
Cranial Fossa Surgery **11**

Diagnostic Evaluation of the Lesions of the Sellar and Parasellar
Region **21**

Pineal Region Tumors **91**

Surgical Management of Posterior Circulation Aneurysms:
Defining the Role of Microsurgery in Contemporary Endovascular
Era **111**

Hemostatic Agents in Neurosurgery **133**

Use of Physical Restraints in Neurosurgery: Guide for a Good
Practice **147**

RESEARCH COLLECTION ON EXPLICATIVE CASES OF CONTROVERSIAL ISSUES IN NEUROSURGERY

Research Collection on Explicative Cases Of Controversial Issues In Neurosurgery

<http://dx.doi.org/10.5772/58106>

Chapters from books edited by: **Francesco Signorelli**

Published by InTech

Janeza Trdine 9, 51000 Rijeka, Croatia

Edition 2014

Copyright © 2014 InTech

Individual chapters are under copyright of their author(s), and distributed under a Creative Commons license. The exact license terms for every individual chapter can be obtained from the Publisher.

Notice

Statements and opinions expressed in the chapters are these of the individual contributors and not necessarily those of the editors or publisher. No responsibility is accepted for the accuracy of information contained in the published chapters. The publisher assumes no responsibility for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained in the book.

Additional hard copies can be obtained from orders@intechopen.com

Research Collection on Explicative Cases Of Controversial Issues In Neurosurgery

p. cm.

ISBN 978-953-51-1534-2

INTECH

open science | open minds

Contents

Explicative Cases of Controversial Issues in Neurosurgery 9

Suboccipital Concentric Craniotomy as Variant for Posterior
Cranial Fossa Surgery **11**

Diagnostic Evaluation of the Lesions of the Sellar and Parasellar
Region **21**

Pineal Region Tumors **91**

Surgical Management of Posterior Circulation Aneurysms:
Defining the Role of Microsurgery in Contemporary Endovascular
Era **111**

Hemostatic Agents in Neurosurgery **133**

Use of Physical Restraints in Neurosurgery: Guide for a Good
Practice **147**

Preface

Neurosurgery is carried out to treat a range of disorders affecting the central and peripheral nervous system, including trauma, tumors, hydrocephalus, spinal disorders, movement disorders (e.g. Parkinson's disease), and drug-resistant forms of epilepsy. This book describes some current issues in contemporary neurosurgery, starting with a study arguing the suitability of suboccipital concentric craniotomy as a reduced-risk approach for posterior cranial fossa surgery. Another chapter describes surgical options for the treatment of pineal tumors, comparing the merits of different patient positioning techniques and approaches, while other chapters discuss hemostasis, microsurgical techniques, and best practice for the use of restraints on neurosurgical patients. As well as surgical techniques and management practices, the book also focuses on methodologies for the diagnostic evaluation of neoplastic, inflammatory, granulomatous, vascular and inflammatory lesions in the sellar and parasellar region of the brain.

This book is a useful source of insight for qualified neurosurgeons, and will also interest advanced students who are hoping to specialize in this branch of surgery.

EXPLICATIVE CASES OF CONTROVERSIAL ISSUES IN NEUROSURGERY

Edited by **Francesco Signorelli**



Suboccipital Concentric Craniotomy as Variant for Posterior Cranial Fossa Surgery

Abraham Ibarra-de la Torre¹, Fernando Rueda-Franco²
and Alfonso Marhx-Bracho²

¹*Hospital Central Sur de Alta Especialidad, PEMEX and*

²*Instituto Nacional de Pediatría
Mexico*

1. Introduction

In the early development of neurosurgery, a common procedure was the posterior cranial fossa surgery exposition using craniectomy.

The approaches to the posterior fossa were directed largely via the occipital squama; with figure of some authors that proposed suboccipital craniectomy and/or craniotomy. The suboccipital concentric craniotomy it's a variant for posterior cranial fossa surgery which considers the principle of fronto-orbital approach, use the concentric craniotomy technique by Laligam N Sekhar, Fotios N Tzortzidis and Jair L Raso in 1997.

2. Alternative procedures

As told, in the early development of neurosurgery, the posterior cranial fossa surgery exposition using craniectomy and/or craniotomy was a common procedure and several authors had described this approach, including combined approaches. Including midline suboccipital craniotomy, superior or inferior, for lesions such tumors of the culmen, pineal tumors, medulloblastoma, cerebellar hemisphere astrocytoma, ependimoma of the IV ventricle, foramen magnum tumors, respectively. The lateral suboccipital craniotomy or paramedian and the lateral suboccipital retrosigmoid approach opening is placed entirely within the squamous portion (immediately inferior to transverse sinus and posteromedial to jugular bulb) out in a retromastoid fashion, the access it offers to the lateral surface of the cerebellar hemisphere is excellent. It is the flap that permits one to work effectively in the pontocerebellar angle, the jugular foramen, or along the lateral surface of the medulla oblongata and pons. Neurinomas, meningiomas, epidermoids, dermoids, chordomas, chondromas, metastases, and cysts constitute the majority of tumors in this region. These techniques had risk of iatrogenic injury to venous sinuses and causing profuse venous bleeding or air emboli. We recently described the suboccipital concentric craniotomy as a variant for posterior cranial fossa surgery, as a variant that have advantage for minor risk of injuries on the venous sinuses, in midline or lateral suboccipital approaches. This paper is dedicated for the latest technique.

3. Indications and contraindications

Injuries of the posterior fossa are varied and different neurosurgical diseases. The indications in this case series were medulloblastoma 5 cases, midline suboccipital craniotomy; pineal germinoma 4 cases, using midline (superior) suboccipital craniotomy; pilocytic astrocytoma in 2 cases, one midline suboccipital craniotomy and the other lateral suboccipital craniotomy; each one case for arteriovenous malformation and aneurysm associated, cerebellar metastases, neurinoma, trigeminal neuralgia. We consider that the suboccipital concentric craniotomy may be used in the different neurosurgical lesions in the posterior fossa, including cerebellar, pineal and the pontocerebellar angle tumors, cerebellar metastasis, vascular lesions and vascular decompression in cranial nerves. This technique has application in children and/or adults. Without contraindications in these cases. Maybe using this craniotomy with combined approach for petroclival meningiomas, supra-infratentorial pre-sigmoid sinus aneurysm, such previous reports for Al-Mefty et al. and Samii and Ammirati, in 1988 or Miller et al, in 1993.

4. Preoperative planning

4.1 Imaging

Computed tomography (CT) or magnetic resonance Imaging (MRI) can establish the diagnosis (alone or together) of the posterior fossa lesion.

4.2 Preoperative preparation

Most of the patients diagnosed with a posterior fossa lesion can be stabilized by using steroids, this given 8 to 48 hours before tumor resection in hopes of reducing peritumoral edema and lowering ICP administer a histamine blockers as prophylactic are at the clinician's discretion; and cerebrospinal fluid diversion, for treat the hydrocephalus using external ventricular drain (EVD) or shunt insertion; the EVD inserted just before the craniotomy, during the same anesthetic; postoperatively, remove bloody, debris-laden cerebrospinal fluid and avoid the risk of acute postoperative hydrocephalus.

4.3 Position

The anesthetized patient is placed in the sitting position (the prone position, the venous oozing obscured the operative field), and the Mayfield three-point fixation device is used to fix the head and the neck slightly flexed forward, for midline approach and a midline linear skin incision (6-7 centimeters in length) begins 2-3cm above the level of the external occipital protuberance and extends as far as C₂₋₃. Dissection of the underlying soft tissue is completed. For the lateral suboccipital approach the skin incision begins approximately 3 cm above and slightly lateral to the external occipital protuberance and extends linearly down 6-8 cm toward the base of the occiput, but may vary. The transesophageal echography was use only in the cases of pineal tumors.

The position and size of major dural sinus were identified for using neuroimaging (see Fig. 2-J). In the midline superior suboccipital craniotomy, lesions such pineal tumor, we don't open the foramen magnum.

4.4 Anatomic landmarks in the posterior cranial fossa

The orientation for any neurosurgical approach begins with consideration of surface anatomic landmarks; the relationships of surface structures to the internal anatomy, and the proper placement of the bony opening (strategic or initial burr-hole). The transverse and sigmoid sinuses are the natural limits of these exposures, the knowledge of the cranial topography constitutes the main factor in the planning of these posterior approaches and reliable landmarks would therefore guide the surgeon in order to reduce the risk of iatrogenic injuries.

Theinion and superior nuchal line, the sagittal, lamboid, occipitomastoid, and parietomastoid sutures are recognizable structures on the external cranial surface and their relationships with the transverse and sigmoid sinuses and torcular herophili or superior sagittal sinus; the asterion, the junction of the lamboid, parietomastoid, and occipitomastoid sutures, has been used in posterior fossa surgery to locate the transverse-sigmoid sinus transition complex.

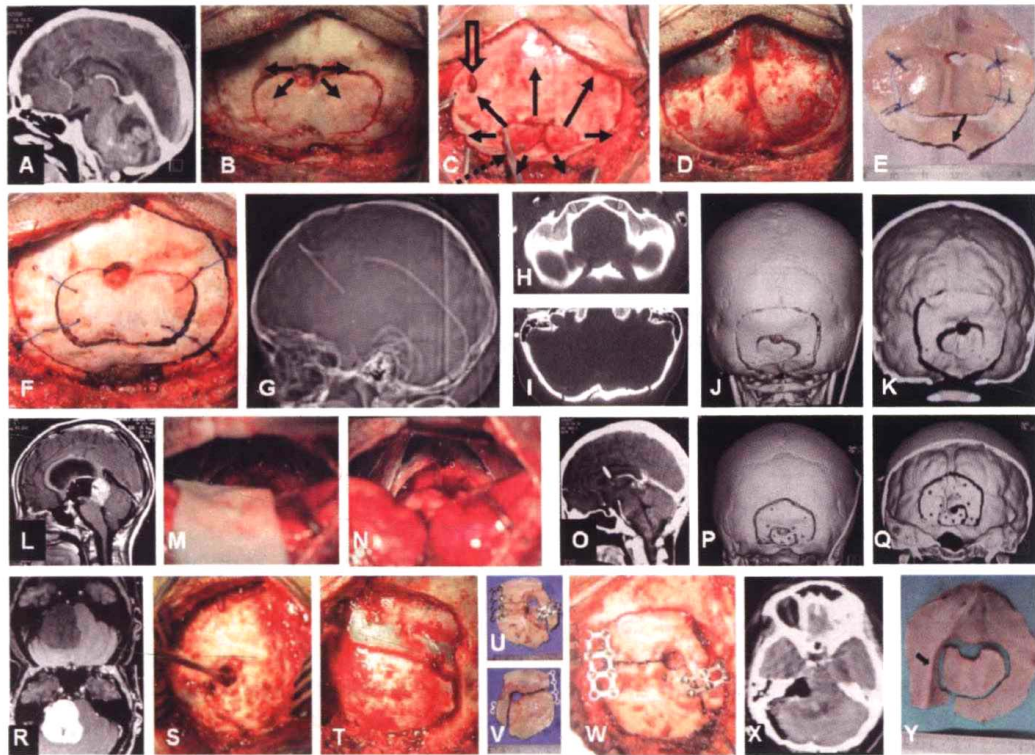


Fig. 1. Surgical technique. Cases 3 (A,B, D to G), 11 (C), 6 (H to K), 10 (L to Q), 16 (R to X) and 4 (Y); the patient with a medulloblastoma by cranial computed tomography (CT) (A) suboccipital concentric craniotomy, medial approach, initial burr-hole inferior to inion and epidural dissection (arrows) for initial craniotomy (B), follow with new epidural-venous sinus dissection (black arrows), look the venous sinus separating (open arrow) with use of dissector through the initial craniotomy (dotted arrow) (C), and cut the complete craniotomy (D) without venous sinus injury; internal cranial view of bone flap with foramen magnum opening (arrow) (E), fixed the bone flap (F), in neuroimaging using CT with reconstruction