Surgical management of spinal meningioma

Thesis

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بسم الله الرحمن الرحيم
﴿ قالوا سبحانك لا علم لنا الا ما علمتنا
إنك انت العليم الحكيم ﴾
صدق الله العظيم
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Abstract

Spinal meningiomas are the second common spinal tumor, they account for 25 -46% of primary spinal cord tumors, It is proved that early surgical intervention is the best management for spinal meningioma.

The current prospective study was carried in Cairo university hospitals on 15 patients suffering from spinal meningioma which were diagnosed by clinical suspicion and radiological investigations, These cases were operated upon by surgical excision through posterior approach and the outcome of these cases and factors affecting the outcome are observed.

In our study we have concluded that early diagnosis and early surgical intervention have better results as delay can lead to permanent neurological deficit. Postoperatively, remarkable improvements in neurological deficits were achieved, however risk factor as age, severe preoperative neurological deficit also if the tumor is ventral to the cord and calcified, surgery becomes challenged, have been considered as predicators of a poor surgical outcome, Also 3 predictor variables for recurrence were invasion of the arachnoid/pia, Simpson resection grade and histological tumor grade. .

Key words:

Neurosurgery - spinal cord - spinal meningioma - Outcome - Surgical intervention .

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List of abbreviations

CT	Computed tomography
EMG	Electromyography
Gd	Gadolinium contrast
H and E	Hematoxylin and eosin stain
LL	lower limb
MEP	Motor-evoked potentials
MRI	Magnetic resonance imaging
SSEP	Somatosensory-evoked potentials
UL	upper limb
WHO	World Health Organization

Introduction

Spinal meningiomas are the second common spinal tumor, they account for 25 - 46% of primary spinal cord tumors they represent 7.5 - 12.7% of all meningiomas of the body, they are slowly growing, well circumscribed tumors, mostly benign in nature, arising from the arachnoid "cap" cells of the arachnoid villi in the meninges.[23]

Commonly arise between the fifth and seventh decades of life, more frequently in females, 75 - 85 % of them arise in women, most frequently present in dorsal spine followed by cervical then lumbosacral spine. [5]

The first reported successful resection of a spinal meningioma was in 1888 by Sir Victor Horsely and Sir William Gowers. While they initially described their spinal tumor as a fibromyxoma, the term “meningioma” that is now universally employed was introduced by Harvey Cushing. Cushing and Eisenhardt defined removal of a spinal meningioma as "one the most gratifying of all operative procedures" With modern imaging, the delay in the diagnosis of spinal meningiomas has been significantly shortened. [10]

Tumor location is one of the most important factors affecting the clinical outcome. Spinal meningiomas are usually localized lateral to the spinal cord, but 15 - 27% of cases are located anteriorly and constitute a surgical challenge. [28]

As the majority of spinal meningiomas are benign, well circumscribed, surgery is the treatment of choice; offers the potential for “cure” without the need for further treatment, however risk factor as age, severe preoperative neurological deficit also if the tumor is ventral to the cord and calcified,

surgery becomes hazardous and may damage the cord have been considered as predicators of a poor surgical outcome. [10]

Aim of the work

The aim of this study to review the literature about the spinal meningiomas, their incidence, clinical picture, the best management, and reveal the factors affecting surgical outcome.

EPIDEMIOLOGY

Meningiomas represent the second common spinal tumors; represent 25 - 46% of all primary intraspinal tumors, most of them are intradural, the fraction of entirely extradural meningiomas range from 3 - 9%.[72]

The relative ratio of meningiomas to nerve sheath tumors, however, varies by population. While the incidence of meningiomas and nerve sheath tumors is about equal in the Western population, in Asian populations, schwannomas are more common and have been reported with ratios of almost 3.8 - 1 in China and 3.9 - 1 in Japan.[30]

There is a female predominance, with spinal meningiomas 75 - 85% of meningiomas arise in women. This female predominance has been postulated to be due to sex hormones or the existence of various other receptor types (steroid, peptidergic, growth factor and aminergic) that may contribute to tumor formation. [7]

Spinal meningiomas can be found in any age group, but they most frequently present between the fifth and seventh decades of life. [57]

Their distribution within the spinal axis varies, with the majority located within the dorsal spine; 76 - 84% of spinal meningiomas are found in the dorsal region.[16]

In the cervical region, the incidence of spinal meningiomas is 14 -27%. While meningiomas are the most common benign tumor found at the foramen magnum, low cervical meningioma are rare. The majority of these are located in the high cervical region. The incidence in the lumbar spine is 2 - 14%,