

ДИАГНОСТИКА
И ЛЕЧЕНИЕ НА
**СУБАКСИАЛНИ
ЦЕРВИКАЛНИ
ТРАВМИ**

Димитър Харитонов

ДИАГНОСТИКА И ЛЕЧЕНИЕ НА СУБАКСИАЛНИ ЦЕРВИКАЛНИ ТРАВМИ



ИЗДАТЕЛСКА КЪЩА
СТЕНО®

Диагностика и лечение на субаксиални цервикални травми

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ВЪВЕДЕНИЕ

Травмите на цервикалния сегмент на гръбначния стълб обхващат приблизително 50% от всички спинални травми и представляват половината от 11 000 гръбначно-мозъчни травми, отчетени годишно в Северна Америка [64, 100]. Субаксиалният цервикален сегмент (САЦС) участва в 2/3 от цервикалните гръбначни фрактури и в повече от 3/4 от всички спинални дислокации [127]. Тези травми са сериозен личностен, медицински и социален проблем, тъй като са свързани с висока инвалидизация, смъртност и животозастрашаващи усложнения. Развитието на хардуера, използван при хирургичните интервенции, прилагани при пациенти със субаксиални цервикални травми през последните години, е впечатляващо. По тази причина последната декада 2001 – 2010 година е наречена „Декада на гръбначния стълб“ („Decade of the Spine“).

Подходът при диагнозата и лечението на пациентите със субаксиални цервикални травми (САЦТ) изисква комплексни усилия на специалисти от различни области – неврохирургия, анестезиология и реанимация, неврофизиология, неврорентгенология, неврореабилитация, отлична организация на медицинската помощ в различни етапи и периоди на травмата, наличието на специализирани центрове за продължителното лечение и наблюдение на болните с гръбначно-мозъчни травми с особен акцент към болните с високи и ниски цервикални травми, както и условия за пълноценно адаптиране на пострадалите.

Стремежът към усъвършенстване на този подход е основната сила, благодарение на която се преодоляват непрекъснатите предизвикателства на изключително сложния проблем, наречен спинална травма.

СЪРЦЕ

МОЗЪК

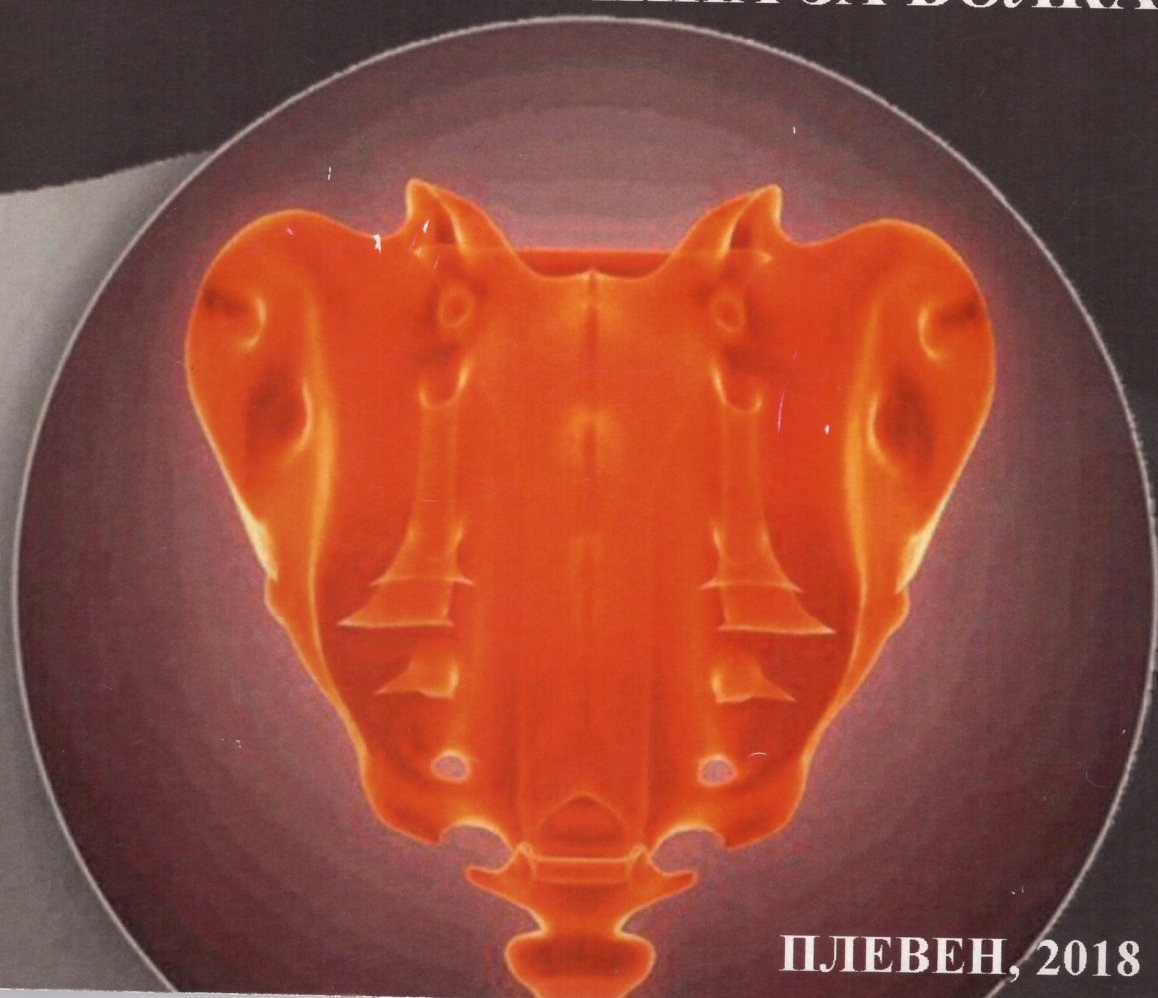
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**ДИМИТЪР
ХАРИТОНОВ**

**САКРОИЛИАЧНАТА СТАВА
СКРИТАТА И ПРЕНЕБРЕГВАНА
ПРИЧИНА ЗА БОЛКА**



ПЛЕВЕН, 2018

Димитър Харитонов

Сакроилиачната става. Скритата и пренебрегвана причина за болка

Плевен

2018

Сакроилиачната става. Скритата и пренебрегвана причина за болка

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ВЪВЕДЕНИЕ

Сакроилиачната става може да бъде причина за изтощаваща болка в областта на гърба и особено в лумбо-сакралната област на гръбначния стълб. Проблемите в тази става може да предизвикат и псевдо ишиас. За съжаление и днес както мускулите са пренебрегвани при диагностицирането на хроничната болка, така и сакроилиачната става е недооценявана в диференциалната диагноза на гръбначните заболявания и лумбо-сакралната област.

Сакроилиачната област обхваща сакрума и илиачните кости, както и техните лигаменти. В човешкото тяло има две сакроилиачни стави, които много погрешно са сравнявани, защото те се различават не само при различните индивиди, но и при едно и също лице.

Голяма част от болката в сакроилиачната област не произхожда от нея, а е свързана с тази област болка. Поради тази причина от съществено значение е да се внимава при поставяне на диагнозата „Сакроилиачна лезия“ и това да се извърши при изключването на другите източници на болка в тази област.

Въпреки, че сакроилиачната става може да бъде източник на болка в лумбо-сакралната област, тя често остава пренебрегвана и недооценена причина за тази болка. Всъщност в миналото се е считало, че сакроилиачната става е най-честата причина за ишиас, но с изясняване на ролята на интервертебралния диск за заболяването, сакроилиачната става остава „забравена“ за медицината.

Болезнените състояния, включващи едната или двете сакроилиачните стави се описват като сакроилиачна болка, дисфункция на сакроилиачните стави или болка в тазовия пояс.

Болката в сакроилиачната област може се дефинира като болка, възникваща от интраартикуларните структури, както и от преден и заден сакроилиачни лигаменти, междукостните лигаменти и ставния хрущял на сакроилиачната става.

Дисфункцията на сакроилиачните стави е състояние на променена механика, увеличаване или намаляване на очакваното нормално движение или наличието на необичайни движения.

Болката в тазовия пояс е разпространена между posterior iliac crest и глутеалната гънка, особено в областта на сакроилиачните стави. Поради тази причина болката в сакроилиачните стави и дисфункцията на сакроилиачните стави се считат като подгрупи на болката в тазовия пояс.

Поставянето на диагноза болка на сакроилиачните стави е предизвикателство за медицинските специалисти, защото и днес надеждността и валидността на използваните тестове остават неизчерпателни (161), а съществуването на Златен стандарт в тази област е противоречиво (158).

Сакроилиачните стави имат няколко важни характеристики:

- изключително стабилни, благодарение на мощният лигаментарен апарат;
- не позволяват движение, запазвайки стабилност;
- предават силите от горната част на тялото до таза, бедрените стави и краката;
- имат структура, поглъщаща ударите;
- осигуряват хармонично движение на таза при ходене или бягане.

ГРЪБНАЧНО-МОЗЪЧНИ ТУМОРИ В ШИЙНАТА ОБЛАСТ

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Съвременното разбиране на проблема за гръбначно-мозъчните тумори /ГМТ/ се основава на схващането за първичните и вторичните увреди на гръбначния мозък от компресивния синдром. Наред с общите клинични закономерности, присъщи на ГМТ, независимо от тяхната локализация, съществуват клинични синдроми, характеризиращи определено ниво на разположение на тумора /6, 7, 9/.

КОНТИНГЕНТ И МЕТОДИКА

Нашият клиничен материал обхваща 37 случая с ГМТ в шийната област ангажиращи нивата C1-Th2. Те съставляват 33% от общо 112 болни с ГМТ оперирани в Катедрата по неврохирургия за десетгодишен период /1987 - 1996 год./ и са на второ място по честота след неоплазмите с гръдна локализация /45%/ /диагр. 1/. Преобладават случаите с по-ниска цервико-брахиална локализация /C5 - Th2/ - 26 болни /70%/. Възрастовият диапазон обхваща болни от 22 до 69 годишна възраст - средна възраст 51 год. /мъже - 54 год., жени - 46 год./ /диагр. 2/. Най-голяма е групата на лицата на средна възраст - 19 болни /51%/. Мъжете са 54% от заболялите /20 болни/, а жените - 46% /17 болни/. В зависимост от отношението на ГМТ към напречното сечение на гръбначно-мозъчния канал:

- * с интрамедуларна локализация на тумора са 6 болни /16%/ /диагр. 3/
- * субдурално-екстрамедуларна - 11 болни /30%/
- * екстрадурална и/или екстравертебрална - 20 болни /54%/.

Според произхода на тумора и неговия хистологичен вид с първични тумори са 17 болни /диагр. 4/ невриноми - 7; менингеоми - 4; епендимоми - 4; астроцитоми - 2; карциномни метастази - 16; вторични тумори - миеломи 4.

Всички болни са изследвани клинично-неврологично с динамично проследяване на симптоматиката, като са приложени редица неврорентгенологични изследвания - КТ, миелография или МР томография при част от случаите.

РЕЗУЛТАТИ И ОБСЪЖДАНЕ

Анализът на клиничния ход на заболяването при болни с ГМТ в шийната област показва съществена зависимост на симптоматиката от разположението на неоплазмата спрямо гръбначния мозък, неговите обвивки и коренчета /5, 9/. Тази зависимост определя и различната продължителност на страданието до момента на неговото диагностициране. Побавна еволюция на заболяването установихме при болните с интрамедуларна локализация на тумора /диагр. 5/ - от 1 до 3 и повече години. При екстрамедуларно-субдурално разположените неоплазми този интервал варира в болшинството от случаите от 6 мес. до 2 години, а за екстрадуралните - от 1 мес. до 1 година. Като най-чести начални симптоми при този контингент пострадали се открояват коренчевите и локални болки, двигателни и сетивни нарушения, а в част от случаите - съчетанието им със смутени тазово-резервоарни функции /диагр. 6/. При 12 от болните с екстрадурални метастатични неоплазми, проявите на ГМТ се явяват като първи симптом на малигниения процес. С коренчеви и локални болки дебютират предимно екстра- и субдурално разположените неоплазми /2, 4, 9/. При болните с интрамедуларно разположение на тумора в шийната област най-често се диагностицират нарушения на повърхностната сетивност от проводников тип самостоятелно или в съчетание с двигателен дефицит.

Честотата на застъпеност на неврологичните симптоми е обусловена както от разположението на тумора спрямо напречника на гръбначно-мозъчния канал, така и от произхода и хистологичния му вид /1, 3, 8/. При болните с интрамедуларни тумори най-често наблюдавахме отпадни сетивни и двигателни нарушения /диагр. 7/, докато при случаите с екстрамедуларно разположени невриноми и менингеоми преобладаваха възбудни коренчеви прояви, последвани от двигателни, рефлексни и сетивни нарушения. В еволюцията на заболяването бе отбелязан Браун-Секаров стадий при 9 болни /невриноми - 3; менингеоми - 2 и карциномни метастази - 4/. При 16 болни с карциномни метастази, разположени екстрадурално, и/или екстравертебрално, ангажиращи нерядко два и

повече прешлена най-често изяви бяха феномени от тотално нарушение проводните функции на мие-лона.

Характерът на оперативната интервенция и резултатите от нея са различни при трите основни групи ГМТ в шийна област /1, 2, 5/. При трима от нашите пациенти с интрамедуларна неоплазма бе извършена задна декомпресия, а при другите трима - и евакуация на кистозно съдържимо. Видимо тотална екстирпация се постигна при 11 болни със субдурално-екстрамедуларно разположение на туморния процес. Характерът на екстрадурално разположените тумори /20 болни/ не позволяваше съществен радикализъм. Метод на избор при тях беше задната декомпресия и освобождаване на компримираните коренчета, а при 4 болни включваше и стабилизиране на засегнатия сегмент от шийната област.

След приложеното хирургично медикаментозно лечение при описания контингент болни с ГМТ с шийна локализация, 13 пациенти бяха изписани с чувствително подобрение /35%/, 23 - без обратно развитие на отпадната неврологична симптоматика /62%/. С усложнение от белодробна тромбоемболия в следоперативния период почина един болен.

Резултатите от нашето проучване при болни с ГМТ в шийната област ни дават основание да направим следните

ИЗВОДИ

1. Диагностицирането на ГМТ в шийна област се базира на пълноценно клиничко-неврологично изследване на болния, подкрепено от съвременните невроизобразителни методики.

2. Злокачествените ГМТ в шийна област не рядко обуславят дебюта на малигнения процес и имат по-кратък ход на развитие от първичните доброкачествени тумори.

3. Индикациите за оперативно лечение се определят от възрастта, соматичния статус и коморбидитета на болния, еволюцията на страданието, данните за костна инвазия на тумора и резултатите от неврорентгенологичните изследвания.

4. Обемът на операцията включва ексцизия на тумора, декомпресия на гръбначния мозък и прилежащите коренчета, а при необходимост и стабилизация на гръбначния стълб.

5. Резултатите от хирургичното лечение корелират с хистологичния вид на тумора, давността на страданието и съпътстващата патология при болния.

6. При злокачествените метастатични ГМТ в шийна област съчетаването на стероидно, хормонално, хирургично, а понякога и лъчелечение допринасят за подобряване качеството на остатъка от живота при този контингент болни.

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ИНТРА- И ПАРАВЕНТРИКУЛНИ ТУМОРИ - КЛИНИКО-МОРФОЛОГИЧНА ХАРАКТЕРИСТИКА И ХИРУРГИЧНО ЛЕЧЕНИЕ

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Резюме:

Обект на проучването са 201 клинични наблюдения на болни с интра- и паравентрикулна локализация на мозъчни тумори,оперирани в Катедрата по неврохирургия - МУ Варна за период от 15 години /1985-1999/.Те съставляват 26% от общо 768 пациенти лекувани оперативно за тумори на главния мозък през същия период.

Анализирани са: възрастово-половата характеристика на болните,честотата на туморите в страничните,третия и четвъртия вентрикули,хистологичните варианти,особеностите в диагностиката,клиничната изява,както и резултатите от хирургичното лечение на вентрикулните и паравентрикулните тумори.

Диагностиката на туморите на главния мозък с интравентрикулна и паравентрикулна локализация се явява сложен и труден проблем,а тяхното хирургично лечение все още е нерядко далече нерешима задача в съвременната неврохирургия/1,3,8,.../.

Поради честото ангажиране на вентрикулната система при мозъчни неоплазми,произхождащи от субependималната глия /известни като паравентрикулни/,ние си позволяваме съвместно разглеждане на интра- и паравентрикулните тумори.

Днес все още е валиден извода на класиците в неврохирургията,че няма клинични симптоми,с помощта на които е възможно да се определи достоверно локализацията на тумора във вентрикулната система.С въвеждането на компютърната и магнитно-резонансна томография е направен качествен скок в ранната им диагностика.От друга страна използването на микрохирургична оперативна техника и микрохирургичен инструментариум повишава възможността за радикализъм при тяхното хирургично лечение /2,5,6,4,.../.

Материал и методи

Обект на проучването са 201 клинични наблюдения на болни с интра- и паравентрикулна локализация на мозъчни тумори,оперирани в Катедрата по неврохирургия - МУ Варна за период от 15 години /1985-1999г./.От тях 119 /59,2%/ са мъже и 82 /40,8%/ - жени.До 14 год. възраст са 22 /10,9%/ ,от 15 до 44г. - 59 /29,4%/ ,от 45 до 59г. - 78 /38,8%/ и над 60 год. възраст - 42 /20,9%/ - /вкл. 1 жена над 75 год./.Средната възраст е 53,5 години /мъже - 53,7г. и жени - 51,3г./.Най-младият пациент е на 2 год.,а най-възрастният на 76 год.В Катедрата по обща и клинична патология са изследвани 142,265 биопсии получени при неврохирургична интервенция.Срезите са оцветени с ХЕ, Van Gieson,PAS,Гомори,Гримелиус.Разпределението на болните по хистологични варианти е както следва: мултиформен глиобластом - 106 /52,7%/;астроцити с различна степен на дедиференциация - 59 /29,3%/;ependими и с малигнизация - 10/5%/;медулобластоми - 10 /5%/;хемангиоми и хемангиоретикуломи - 8 /4%/;папиломи на плексус хориоидеус - 4 /2%/;олигодендроглиоми - 3 /1,5%/ и колоидни кисти - 1 /0,5%/.Злокачествени и с елементи на изразена малигнизация тумори установихме у 170 наши наблюдения /84,6%/ ,а доброкачествени - при 31 /15,4%/.С предимно интравентрикулна локализация на тумора бяха 68 /33,8%/.Преобладаваха супратенториалните тумори - при 127 /63,2%/ ,а при 74 /36,8%/ беше засегнат IV вентрикул.

Резултати

За периода 1985-1999г. в Катедрата по неврохирургия са диагностицирани и оперирани общо 768 пациенти с тумори на главния мозък.От тях болните с интра/паравентрикулна локализация на тумора съставляват 26,2%/201 болни/.Тези с предимно интравентрикулна локализация бяха 8,9%/68



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Alcaptonuria with lumbar disc prolapse: case study and review of the literature

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Abstract

BACKGROUND CONTEXT: Patients with alcaptonuria frequently complain of pain in the large joints and the spinal column, this condition is being assumed to be normal. It is very rare for patients with ochronosis to undergo lumbar surgery since the disk protrusion is not characteristic for them and overlaps with the general complaints due to the spondylarthritic and stenotic changes.

PURPOSE: To prove the possibility of a lumbar disc herniation in a patient with alcaptonuria as a real entity that causes lumbar and radiculalgic complaints.

STUDY DESIGN: A case of a 33-year old patient with alcaptonuria and lumbar disc herniation is presented.

METHODS: The case is presented together with its clinical course, the diagnostic techniques, the surgical findings, histological results and the treatment outcome.

RESULTS: After the surgical treatment the patient's complaints were alleviated and almost no complaints were registered, during the next follow-up.

CONCLUSIONS: The most common symptoms seen in alcaptonuria are complaints of pain in large joints and back pain. They are usually associated with the main disease. The case we present demonstrates that even there is a small likelihood for a prolapsed lumbar disk, it should be sought in such patients as the surgical treatment is able to yield a positive results. © 2007 Elsevier Inc. All rights reserved.

Keywords:

Alcaptonuria; Lumbar disc; Herniation; Ochronosis

Introduction

Alcaptonuria is a very rare hereditary metabolic disease with an incidence of approximately 1 in 1 million individuals [1,2]. It is inherited as an autosomal recessive trait and is characterized by an absence of the enzyme homogentisic acid oxidase, which is involved in the metabolic pathway of aromatic amino acids in the liver and the kidneys and subsequent excretion of homogentisic acid in urine [3,4] or is accumulated in the tissues. The oxidation and the polymerization of homogentisic acid leads to black coloration of standing urine and all connective tissues where it is deposited [3,4]. Pigmentation may be seen on the skin, the teeth, the

nails, and the patient's buccal mucosa; this condition is called ochronosis [5,6]. In ochronosis, the pigment is deposited with great affinity in the hyaline cartilages of the large joints, the sclera, and the intervertebral discs [3]. With the advance of age, usually in the third and fourth decade, severe degenerative disorders occur in the joints and the spinal column, mainly in the thoracic and the lumbar area [7]. The clinical manifestations resemble those of rheumatoid arthritis, but the radiological investigations indicate severe osteoarthritis and ankylosis of the affected segments. Although disc degeneration is common in ochronosis, prolapsed lumbar disk is unusual, and there are only single cases of surgically treated patients published in the literature.

Case report

A 33-year-old patient with confirmed alcaptonuria, married with a daughter aged 10 who had also suffered from alcaptonuria for 1 year, complained of pain in the lower

FDA device/drug status: not applicable.

Nothing of value received from a commercial entity related to this manuscript.

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CLINICAL AND OPERATIVE ANALYSIS OF 45 UNSUCCESSFULLY OPERATED LUMBAR DISC HERNIATIONS

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SUMMARY

A 341 patients with lumbar disc herniation were operated for a period of 9 years (1997 – 2005) in the Neurosurgical clinic of Varna. On the postoperative follow-ups 45 of them presented with unsatisfying results. The main factors caused recurrent low back pain were spinal stenosis (central or lateral), residual disc fragments, epidural fibrosis, disc herniation on another level, spinal nerve root damage, infections, psychological or other unknown factors. The results were estimated for a short- and long-term period.

Keywords: lumbar disc herniation, recurrent, FBSS, stenosis

INTRODUCTION

The patients with unsatisfying postoperative results after lumbar discectomy are significant problem and challenge for the modern neurosurgery, with rate between 8 and 30% according to different actual surveys (1,2,3,9,11). Introduced in this respect term FBSS (failed back surgery syndrome) and often applied as a diagnosis is not always precise because it integrates heterogeneous group in respect of etiology, surgical and nonsurgical factors that cause lasting pain syndrome and neurological symptoms. Identification of the exact reason for FBSS is more and more attainable in the modern spinal surgery, especially with the advent in the last 20 years of the modern neuroimaging (CT, MRT) and also micro neurosurgery (7,8,9,11).

In the present study we make an effort towards analyzing our clinical and operative experience with 45 patients with unsatisfying postoperative results diagnosed prior the operation with lumbar disc herniation. In this cohort we try to identify the commonest surgical reasons that cause FBSS, also to point how to improve the surgical procedures used in this pathology in order to reduce the FBSS cases.

METHODS

A cohort of 45 patients with unsatisfying postoperative results after surgery for lumbar disc herniation operated for a period of 9 years (1997 – 2005). The group comprises patients also patients that are operated for a first time out of the Neurosurgical clinic of Varna, also patients that are op-

erated abroad. Of them 29 are men and 16 women, with mean age of 45,6 years, 38 are reoperated once, 5 are reoperated twice, one patient is operated three times and one more than three time. The patients' complaints before the last reoperation are as follows: up to 1 year – 29; up to 2 years – 11; more than 2 years – 5. Patients' number varies in respect of age as follows: between 20 and 30 years are 6; 30 – 40 years – 7; 40 – 50 years – 17; over 50 years are 15. All the patients are diagnosed after thorough clinical examination, conventional X-ray, CT scans, myelography, MRI, EMG etc. Subgroup of 30 patients has complaints that are similar as prior to initial operation, whereas aggravation is registered among 15 patients. The analyzed factors that caused FBSS are presented on table 1:

Tabl. 1.

	n	%
Lateral stenosis	13	29
Retained disc	7	15,5
Epidural fibrosis	10	22,2
Recurrent disk herniation or another level herniation	4	8,9
Nerve root damage or ruptured dural sac	4	8,9
Wound suppuration	5	11,1
Wrong level	1	2,2
Unknown	1	2,2

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Cell proliferation index predicts relapse of brain metastases in non-irradiated patients

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Abstract

Background Brain metastasis is a common complication and a major cause of morbidity and mortality in human malignancies. We investigated whether the proliferating cell index of surgically treated single brain metastasis would predict the relapse at a location remote from the initial resection site within 2 months of the excision in patients with uncontrolled systemic disease and not subjected to adjuvant whole brain radio-therapy.

Materials and methods Tissue biopsies derived from 25 patients with brain metastases specifically selected to be a single totally resected lesion and not treated subsequently by radiotherapy to the whole brain were stained by immunohistochemistry for the marker CDC47 and the proliferation index was calculated. The index was then analysed with respect to clinical parameters, including the incidence of brain relapse within 2 months of the first

resection, the timing of diagnosis of brain metastasis as compared to the primary cancer diagnosis, and the perifocal brain oedema.

Results Statistical evaluation of the indexes in the patients with brain metastases relapsing within 2 months after the first craniotomy ($n=13$) revealed significantly higher values as compared to the patients with lesions which had not relapsed or which had relapsed more than 2 months after first craniotomy ($n=12$). The synchronous brain metastasis (that is, those occurring before or within 2 months of the primary cancer diagnosis) had a significantly higher proliferation index than the metachronous lesions (those occurring more than 2 months after primary cancer diagnosis).

Conclusions The synchronous brain metastasis relapses within 2 months of primary resection and have a significantly higher proliferation index than the metachronous lesions which did not recur within 2 months. These results indicate that the estimation of the proliferation index of metastatic brain tumours may be helpful in predicting the course of disease progression.

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Keywords Brain · Metastasis · Recurrence · Proliferation · Index · Prognosis

Introduction

Metastasis to the brain is a severe complication of systemic cancer and the most common intracranial tumour in adults [16]. In adults, metastasis to the brain most commonly arise from primary tumours of the lung (50–60%), breast (15–20%), skin (5–10%; melanoma), and gastrointestinal tract (4–6%) [20, 31], or are of unknown origin. Incidence is rising with improved survival of cancer patients, and brain

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Sinus histiocytosis with Massive Lymphadenopathy, or Rosai-Dorfman disease (RDD), is a rare histiocytic proliferative disorder. It was first described in 1969 by Juan Rosai and Ronald Dorfman.^{8,9}

The cause of RDD is obscure; molecular studies have shown that RDD is a polyclonal and reactive process rather than a neoplastic one.⁶

Serological evidence of Epstein-Barr virus is documented in about 50% of cases; however, the presence of Epstein-Barr virus carriage has not been demonstrated in histiocytes and lymphocytes by the in situ hybridization technique.¹¹

Generally patients present in their mid-20s and the typical form presents with massive cervical lymphadenopathy (87%) associated with fever, elevation of the erythrocyte sedimentation rate, and hypergammaglobulinemia. Extranodal involvement occurs in 25% to 43% and affects the skin (12%), paranasal sinuses (11%), soft tissue (9%),

Isolated Rosai-Dorfman Disease of the Cerebellar Hemisphere as a Rare Differential Diagnosis of Metastatic Brain Disease. Case Report

Sinus Histiocytosis with Massive Lymphadenopathy, or Rosai-Dorfman disease (RDD), is a rare histiocytic proliferative disorder. Generally patients present with massive cervical lymphadenopathy. Intracranial localization is a rare manifestation of RDD. The majority of the cases with intracranial involvement are reported to be with supratentorial, dural-based localization. Only a few cases of the posterior cranial fossa involvement have been reported in the literature. We report a case of isolated cerebellar hemisphere RDD which was initially misdiagnosed as a metastatic brain disease.

Key words: cerebellar, brain, metastases, isolated, Rosai-Dorfman,

bone (9%), salivary gland (5%), oral cavity (3%), kidney (2%), lower respiratory tract (2%), larynx (1%), and, rarely, other locations.^{2,4,10} Intracranial localization is a rare manifestation of RDD.

Case Report

A 47 year-old woman with anamnesis for skin melanoma resection a year ago, presented at the emergency unit of our hospital with three days history of severe headache, vertigo, vomiting and tinnitus. The severity of the complaints increased with change of the head position. The physical examination revealed no other abnormalities. After CT scan and subsequently MRI that showed not enhancing oval lesion in the left cerebellar hemisphere, without an evident mass effect on the fourth ventricle (**Figure 1, Figure 2**), the patient was admitted at the Clinic of Neurosurgery to be prepared for operative treatment. Routine hematological and biochemical studies were normal except for the erythrocyte sedimentation rate, which was

SEVERE HEAD INJURY ASSOCIATED WITH MULTISYSTEM INJURIES

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ABSTRACT

The incidence of severe head injury (SHI) varies between 20-30/100000. In the developed countries, the SHI contributes for over 50% of the dead outcomes among the trauma patients. Many investigations statistically prove that associated with SHI multisystem injuries negatively affect the outcome. In the present study we aim to investigate which organs and system having concomitant injury with SHI have a maximal negative influence to the outcome. We also aim to systematize the influencing factors, also to revise the treatment strategy. Our investigation is based on a cohort of 57 consecutive patients with dead outcome admitted to "St. Anna" Hospital for the period 2004 - 2006 year. The patients are classified according the localization of the associated injuries. A clinico-therapeutic classification was also made based on the severity of the patient's condition, also according to the necessary urgent management.

Key words: severe, head, multisystem, injury, classification, management, outcome

INTRODUCTION

The incidence of severe head injury (SHI) varies between 20-30/100000. In the developed countries, the SHI contributes for over 50% of the dead outcomes among the trauma patients (2,5,13). In the USA 25% of all hospitalized trauma patients are patients with SHI. Furthermore over 60% of the dead outcomes among trauma patients in the hospitals is related to SHI (2,16).

Many investigations statistically prove that associated with SHI multisystem injuries negatively affect the outcome (4). In recent days multiple factors and mechanisms that are involved in the secondary brain damage were identified (11). The majority of them are as a result of concomitant injury to other organs and systems, that specifically trigger a chain of pathologic events that cause brain edema ischemia hypotonia, hypoxemia, hypercapnia, etc. (2,5,11,15).

In the present study we aim to investigate which organs and system having concomitant injury with SHI have a maximal negative influence to the outcome. We also aim to systematize the influencing factors, also to revise the treatment strategy.

MATERIAL AND METHODS

Our investigation is based on a cohort of 57 consecutive patients with dead outcome admitted to "St. Anna" Hospital for the period 2004 - 2006 year. On admission patients are with SHI - GCS < 8 p. and concomitant injuries to other organs and systems.

Patient's records, imaging, perative protocols and pathologoanatomical findings are analyzed. In the investigated group 38 (67%) are men and 19 (33%) are women with mean age 49,5 (4-88).

In the first 24 hours 23 (40%) of the patients died, while 15/23 (65,2%) died due to asphyxia because of chest injury or aspiration of blood or gastric contents. The average hospitalization period is 6.33 days (0-84). Among the most common reasons for polytrauma are acceleration - deceleration - car accidents - 34 (59,6%), falls from height - 15 (26,3%), also everyday life trauma - 8 (14,1%).

The patients are classified according the localization of the associated injuries, respectively "C" for cerebrum, "T" for thorax, "A" for abdomen and "O" for orthopedic.

Tabl. 1.

Bi-regional	Tri-regional	Quad-regional
CT n=23	CTA n=7	CTAO n=7
CA n=10	CTO n=3	
CO n=7		
70%	17,%	12,5%

The most common are the bi-regional injuries - 40 cases (70%): CT - 23; CA - 10; CO - 7; Next come the tri-re-

ХИРУРГИЧНО ЛЕЧЕНИЕ НА МЕТАСТАТИЧНИТЕ СПИНАЛНИ НЕОПЛАЗМИ В ТОРАКОЛУМБАЛНИЯ ОТДЕЛ. ИНДИКАЦИИ, СТРАТЕГИЯ, БЛИЗКИ СЛЕДОПЕРАТИВНИ РЕЗУЛТАТИ

Св. Калевски, Н. Пеев, Д. Харитонов, Ст. Дянков

SURGICAL TREATMENT OF METASTATIC SPINAL NEOPLASMS IN THORACO-LUMBAL REGION. INDICATIONS, STRATEGY, EARLY POSTOPERATIVE RESULTS

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РЕЗЮМЕ

Цел и задачи: Гръбначният стълб е най-честата локализация на костните метастази в човешкото тяло, а метастатичните спинални неоплазми са най-често срещаните от всички гръбначномозъчни тумори. В статията авторите си поставят за цел да проучат ретроспективно близките следоперативни резултати при пациенти със симптоматични тораколумбални метастази, както и да се прецизират индикациите и хирургичната стратегия. За оптимални резултати авторите препоръчват максимална резекция на тумора и спинална стабилизация със задни и заднолатерални хирургични техники.

Методи: Проучени са ретроспективно 85 пациенти, оперирани по повод метастази в тораколумбалния отдел на гръбначния стълб за периода януари 2005 – март 2009. При болшинството от пациентите е използвана спинална инструментация.

Резултати: Използвайки VAS и ODI са проследени близките следоперативни резултати при 64 (75.3%) от пациентите до един месец след изписването. От тях 55 (86%) съобщават за подобрене на болевия синдром, а при оценка на функционалния им статус подобрене се отчита при 51 (79.7%). Компликациите включват ранева инфекция при 5 (5.9%), ликворея при 3 (3.5%), а 10 (11.8%) пациенти след интервенцията са развили пневмония.

Изводи: Показани за хирургично лечение са селектирана група пациенти с гръбначномозъчни метастази. Хирургичното лечение дава добри резултати по отношение на болевия синдром и функционалния статус при болшинството от случаите.

Ключови думи: СПИНАЛНИ НЕОПЛАЗМИ, МЕТАСТАЗИ, СПИНАЛНА НЕСТАБИЛНОСТ, СПИНАЛНА РЕКОНСТРУКЦИЯ, ОПЕРАТИВНИ ИНДИКАЦИИ, ГРЪБНАЧЕН СТЪЛБ, VAS, ODI

SUMMARY

Background: The bone is a common site of metastasis for a number of different cancers. Among the patients with malignancies, the vertebral column is most commonly involved in the process of metastasing to the bones.

With the current study, authors aim to investigate retrospectively the close postoperative results among the patients with symptomatic spinal metastases in the thoracolumbar region, also to comment on the indications for surgery and the surgical strategy among these patients. Authors recommend maximal possible resection of the tumor and spinal stabilization using posterior or posterolateral surgical approaches.

Methods: The investigated cohort of 85 patients with vertebral metastases in the thoracolumbar region is operated in the Clinic of Neurosurgery, St. Anna Hospital for the period January, 2005 – March, 2009. Spinal instrumentation technique is applied in the ma-

Incidental Dural Tears in lumbar decompressive surgery: Incidence, causes, treatment, results.

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BACKGROUND: Incidental dural tears or durotomy (ID) during lumbar decompressive surgery is a relatively rare complication causing severe consequences. Their incidence varies widely among different authors (1-17%) and in general depends on the type and complexity of the spinal procedures performed.

With the present investigation the authors aim to evaluate the incidence of incidental durotomies during the different types of decompressive and reconstructive surgical procedures in the lumbar region, also indicating the most common reasons for incidental durotomies, treatment options and the early and remote outcome.

MATERIAL AND METHODS: The records of 553 consecutive patients with different types of posterior and posterolateral decompressive and reconstructive procedures in the lumbar region are investigated retrospectively for the period January 2005 – march 2009.

RESULTS: The overall incidence of the incidental durotomies in the investigated group is 12.66%. In the subgroups it varies depending on the specificity of the surgical procedures performed. The biggest is the number of IDs in the reoperative spinal surgery subgroup, followed by the subgroup of the patients who sustained spinal trauma, followed by those with degenerative spinal stenosis, tumors and lumbar disc herniations.

CONCLUSION: IDs should be considered as a serious complication with a multitude of unwanted consequences for the patients. Prevention is the best way to treat the complications and disability that attend the unwanted dural tears. Knowing about the mechanisms and predisposing factors for that objectionable complication is a matter of utmost importance when planning and performing spinal surgical procedures.

Keywords: incidental durotomy (ID), unintentional dural tear, CSF leak, spinal surgery, complication

BACKGROUND

The incidental durotomy during lumbar decompressive surgery is a relatively rare complication that could cause severe complications. The incidence of incidental durotomies varies widely among authors (1-17%)^{3,6-8,10,12,13,16} and in general depends on the type and the complexity of the spinal procedures^{3,6,15,16}. The majority of authors relate the increased rate of dural tears with the increase of reoperation rate, respectively with epidural fibrosis, and with the advanced spinal degenerative changes with ossified yellow ligament among elderly people undergoing surgery^{3,6,15,16}. The number and complexity of

spinal procedures is increasing in the last decades, leading to a greater prevalence of dural tears¹. One of the important intraoperative mechanisms other than direct laceration of the dura include excessive nerve root traction during the removal of big disc extrusions and implantation of spinal instrumentation. When dural injury occurs, in the majority of cases it is detected intraoperatively, and primary repair is mandatory with the established surgical techniques. Unfortunately not all dural tears can be recognized and repaired adequately primarily. Even with experienced surgeons, inadvertent, pin-hole-type durotomies may go unrecognized during surgery. If a defect goes undetected or is not properly closed, the patient

DIAGNOSTIC PITFALLS OF BRAIN METASTASES AFTER BRAIN IRRADIATION.

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ABSTRACT

Although brain metastases are one of the most frequently diagnosed sequelae of systemic malignancy, their optimal management still is not well defined. In that respect the different diagnostic and therapeutic approaches of BMs patients is an issue for serious discussions. Among the most commonly used diagnostic tools are computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, single photon emission computed tomography (SPECT) and positron emission tomography (PET) scans etc. Nowadays the aforementioned diagnostic modalities are usually combined in order to obtain complete diagnostic information important for establishing the optimal treatment.

With the present report we try to elaborate on the value of the modern diagnostic tools in differentiating between tumor progression versus radiation necrosis in irradiated patients with resected brain metastases.

Although the present advancement of the modern imaging modalities differentiating between tumor progression versus radiation necrosis is often difficult. Application of the metabolic imaging modalities like SPECT, PET and proton magnetic resonance spectroscopy (1H-MRS) contributes for the diagnose but still pathological specimens remain a gold standard for distinguishing tumor from necrosis, because none of the imaging modalities is possible to reliably differentiate necrosis from progression in 100% of the cases.

Key words: brain metastases, gamma knife, surgical resection, stereotactic radiosurgery, metabolic imaging modalities

INTRODUCTION

According the published data, the number of the patients with malignant diseases, also the patients in the final IV stage of the TNM Classification of Malignant Tumours (TNM), respectively the patients with BMs constantly and steadily increase, despite the tremendous and continuous advancement of the modern medicine.[25,26] All this inevitably results in increase of the number of the patients with metastases, and in particular patients with brain metastases (BMs).[11]

According to the literature about 20-40% of the patients with neoplastic diseases develop BMs and presently

comprise about 0,15% of the population of the earth.(2, 9, 11)

It is known that presence of brain metastases indicate that patients are in the final IV stage (TNM) with the respective prognosis for the life expectancy for less than a year. Irrespective of the bad prognosis, a correctly chosen therapeutic approach adds to the survival and improvement of the quality of life mainly through the reduction of the intracranial hypertension, neurologic deficiency, pain, etc.

Although brain metastases are one of the most frequently diagnosed sequelae of systemic malignancy, their optimal management still is not well defined.(4, 10, 16) In that respect the different diagnostic and therapeutic approaches of BMs patients is an issue for serious discussions.

Among the most commonly used diagnostic tools are are computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, single photon emission computed tomography (SPECT) and positron emission tomography (PET) scans, etc. Nowadays the aforementioned diagnostic modalities are usually combined in order to obtain complete diagnostic information important for establishing the optimal treatment. Along with the conventional diagnostic tools like CT and MRI - scans, application of the metabolic imaging modalities like SPECT, PET and proton magnetic resonance spectroscopy (1H-MRS) contributes for the complete diagnose.

Usually the surgical resection and gamma knife radiosurgery are considered as an alternative and competitive options for the treatment of the patients with brain metastases.(1, 6, 14, 18) Recently many studies show that microsurgery, radiosurgery and radiation therapy are not mutually exclusive options, but quite the contrary. Nowadays, more than one option is used for the same patient and combining these treatment modalities gives better results than when separately use them. Usually after the surgical resection of BMs, the patients are irradiated - whole brain radiation therapy (WBRT) or Gamma Knife surgery (GKS). (6, 7, 12, 13, 20, 23, 24)

With the present report we try to elaborate on the value of the modern diagnostic tools in differentiating between tumor progression versus radiation necrosis in irradiated patients with brain metastases.

Although the present advancement of the modern

КЛИНИЧЕН ЕФЕКТ НА ИНТЕРСПИНОЗНИТЕ ДИНАМИЧНИ СПЕЙСЪРИ ПРИ ЗАДНА ДЕКОМПРЕСИВНА ХИРУРГИЯ ПО ПОВОД ЛУМБАЛНА ДЕГЕНЕРАТИВНА СТЕНОЗА

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Резюме

Увод и цел: През последните години в спиналната хирургия бяха развити и въведени различни видове предни и задни динамични стабилизиращи системи, които фиксират симптоматичното ниво без фузия, запазват сегментните движения и разтоварват съседните двигателни сегменти. Едни от тези системи са интерспинозните динамични спейсъри (ИДС). Целта на проучването е да се анализира клиничният ефект от ИДС при пациенти с лумбална дегенеративна стеноза (ЛДС) и задна неврална декомпресия.

Пациенти и методи: В проучването са включени 26 пациенти (15М/11Ж) ср. възр. 48,33 години (33/74) оперирани от нас през последната година със симптоми и МРТ данни за ЛДС и минимум 3 месеца неуспешно консервативно лечение. Пациенти с изразена дегенеративна спондилолистеза (≥ 5 мм) и истмична спондилолистеза не са включени в проучването. На всички са извършени декомпресивни процедури и са имплантирани ИДС – CoflexTM. За оценка силата на болевия синдром преоперативно и при контролите използваме визуалната аналогова скала (VAS), а за оценка на функционалния статус преди и след интервенцията използваме Осуестри инвалидния индекс – ОИИ – 2 версия - Oswestry Disability Index (ODI). Среден период на проследяване е 6,2 месеца (2/11).

Резултати: Средните стойности на преоп. VAS са 7,25 (± 0.75) и падат до 1.5 (± 0.6) при изписването или един месец след операцията ($p < 0.05$). При последните проследявания средните стойности на VAS са 1.35 (± 0.45) ($p < 0.0001$). Освен това не се отчита статистически значима разлика между стойностите на ранния постоперативен период (до 1 месец) и късните проследявания ($p = 0.721$). Средните стойности на преоп. ODI са 80.5 (± 3.1) и намаляват до 12.1 (± 1.6) постоперативно или един месец след интервенцията ($p < 0.05$). При последното проследяване след средно 6 месеца средните стойности на ODI са 11.8 (± 1.2) ($p < 0.0001$). Може да се

Lumbar Intraforaminal Synovial Cyst in Young Adulthood: Case Report and Review of the Literature

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Abstract

Study Design Case report.

Objective Lumbar juxtafacet cysts (synovial and ganglion cysts) are a rare cause of low back and radicular leg pain. Most patients with lumbar cysts are in their sixth decade of life and have significant facet joint and disk degeneration. Lumbar synovial cysts (LSCs) are extremely rare in adolescence and young adulthood, and to our knowledge, only two pediatric cases of LSC have been reported in the literature. We aim to prove the existence of LSC in adolescent patients as a real entity that causes low back and radicular complaints and to discuss the possibility of traumatic injury as a pathogenic cause of LSC formation in adolescence. A case of an 18-year old patient with LSC is presented. We report the clinical presentation, management, outcome, and review of the literature, focusing on issues that remain debatable.

Keywords

- lumbar synovial cysts
- adolescents
- young adults
- lumbar spine
- juxtafacet cysts
- rare case
- radicular pain

Methods The case is presented together with its clinical course, the diagnostic techniques, the surgical findings, histologic results, and the treatment outcome.

Results After surgical treatment, the patient's complaints were alleviated and almost no complaints were registered during the next 6 months' follow-up.

Conclusions LSCs are extremely rare in adolescence, but they could be considered in the differential diagnosis in adolescent patients with low back pain and radiculopathy. Surgical removal of LSC could be considered as a treatment option to provide immediate and safe symptomatic relief.

Introduction

The term *lumbar synovial cysts* (LSCs) refers to cysts that arise from the zygapophyseal joint capsule of the lumbar spine. Kao et al were the first to report symptomatic spinal nerve compression resulting from an LSC and renamed these synovial and ganglion cysts as "juxtafacet" cysts (JFC).^{1,2} The etiology of JFCs is unknown; possibilities include synovial fluid extrusion from the joint capsule, latent growth of a developmental rest myxoid degeneration, and cyst formation in the connective tissue. Increased motion seems to have a

role in many cysts, and the role of repetitive microtrauma is debated by many authors.^{3–6} Both synovial and ganglion cyst have similar clinical and radiographic features and are considered as an extrusion of the synovium through a capsular defect from degenerative or unstable facet joint.^{6–9} In the last decade, improved imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) have resulted in increased reporting, diagnostic yield, and treatment options of spinal synovial cysts.^{3,6,8,10–16} The prevalence of LSC is unknown, and it is highly possible that there is no uniform distribution in all populations (0.65 to

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SURGICAL MANAGEMENT OF SYMPTOMATIC LOW BACK PAIN AND MONORADICULAR LEG PAIN IN ADOLESCENT AND YOUNG ADULT PATIENTS

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Abstract: Objectives: The purpose of the present retrospective study is to draw attention to symptomatic low back pain in adolescent patients, in order to encourage earlier diagnosis and surgical treatment. The study assessed the radiological, clinical features and surgical outcomes of 13 of this kind of patient.

Materials and Methods: Out of a series of 983 consecutive cases (1999–2011) of lumbar disc excisions from our neurosurgical institution, 13–1,32% of the patients were between the ages of 15 and 20 mean 17,84. Fifteen operations, including two reoperations, were performed on this patient group, by a conventional microsurgical procedure. The indications for surgery were failure of conservative treatment, intractable pain and/or progressive neurological impairment.

Results: Low back pain and monoradicular sciatica were the main complaints in 77%, but findings of neurological deficits were rare — 1 case. The surgical findings revealed a protruding disc in eleven cases, one lateral recess stenosis and one lumbar synovial cyst. Initially, all patients were treated conservatively by their physicians more than 3 months without success. On the day of discharge, Kirkaldy-Willis criteria results were excellent or good in 92% of patients. The follow-up period ranged from 6 months to 2 years with an average of 1 year and 2 months. The results were excellent in 10 patients and good in 3 patients.

Discussion: We demonstrate that the cause of low back pain and monoradicular leg pain in adolescent patients may not only be a cause of herniated lumbar disc or lateral recess narrowing. Very rarely these symptoms may be caused by lumbar synovial cysts.

Conclusion: Surgical treatment of adolescent patients is able to relieve the clinical symptoms quickly.

Clinical symptoms such as low back pain and leg pain and the neurologic deficit disappear within 3 months after surgery.

Key words: adolescent, disk, herniation, surgery, treatment.

INTRODUCTION

Degenerative changes in the intervertebral disc begin at the late teens, after the completion of the physical growth and development, during which posterior herniation of the nucleus pulposus can cause sciatica because of nerve root compression (1). Symptomatic low back pain and monoradicular leg pain are rare in patients under age of 20 years (2, 3, 4). There are a number of differential diagnoses to be considered in patients with the mentioned complaints (5). Most often they are due to lumbar disc herniation (LDH). Another cause of radiculopathy in adolescents could be spinal tumors (5, 6). They are also in the domain of the neurologists and neurosurgeons, because many of them may present with neurologic deficits (7). Epiphyseal ring fracture, disc space infection, congenital malformations and spinal synovial cysts also could be considered (5, 6, 8, 9, 10). Lumbosacral intervertebral disc changes that cause sciatica and other neurological manifestations in the lower extremities are generally thought to be encountered mostly among the adults in the third decade of their life or later (11). Lumbar disc herniation is rare in children and adolescents (12). The clinical presentation and aetiology of (LDH) may differ from that in adults (5, 13). While the true incidence is not known, studies have shown that of all patients operated for disc herniation, less than 3% are under 20 years of age (14, 15). Like the incidence, the aetiology

IS THERE A CORRELATION BETWEEN SPINAL CANAL COMPROMISE IN THORACIC AND LUMBAR BURST FRACTURES AND NEUROLOGICAL DEFICIT?

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ИМА ЛИ ЗАВИСИМОСТ МЕЖДУ СТЕСНЕНИЕТО НА ГРЪБНАЧНИЯ КАНАЛ ПРИ ВЗРИВНИ ТОРАКАЛНИ И ЛУМБАЛНИ ФРАКТУРИ И ТЕЖЕСТТА НА НЕВРОЛОГИЧНИЯ ДЕФИЦИТ?

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РЕЗЮМЕ

ДИЗАЙН НА ПРОУЧВАНЕТО

Извършено е ретроспективно клинично и рентгенологично проучване, за да се установи има ли зависимост между степента на стеноза на гръбначния канал при гръдни и лумбални взривни фрактури и тежестта на неврологичния дефицит.

ЦЕЛ

Да се определи дали е налице корелация между тежестта на неврологичния дефицит и стенозата на гръбначния канал.

ВЪВЕДЕНИЕ

В съвременната спинална литература зависи-мостта между степента на оклузия на гръбнач-

ABSTRACT

STUDY DESIGN

A retrospective clinical and radiographic study was performed, to review the correlation between the traumatic spinal canal stenosis in thoracic and lumbar fractures and neurological deficit

OBJECTIVES

To determine whether there is a correlation between the degree of neurological deficit and the stenosis of the spinal canal.

BACKGROUND DATA

In modern spinal literature, the correlation between the degree of protrusion of bone fragments into the spinal canal and the severity of neurological deficits

ния канал от костни фрагменти при тораколумбални (ТЛ) взривни фрактури и тежестта на неврологичния дефицит не е категорично установена и е обект на много спорове.

МЕТОДИ

За период от 2008 до 2013 г., общо $n = 205$ пациенти с различни видове торакални и лумбални фрактури, класифицирани по AO/Magerl са оперирани в нашата клиника. От тях $n = 109$ (53,17%) са с взривни фрактури. На всички е извършено измерване на степента на стеснение на гръбначния канал. Техниката на измерване включва съотношението на сагитален диаметър на гръбначния канал на нивото на увреда, към диаметъра на съседно ниво на аксиални КТ срезове, което се сравнява с тежестта на неврологичния дефицит, класифициран по Frankel/ASIA.

РЕЗУЛТАТИ

Средното стеснение на спиналния канал е 35.47% (6/97%) сравнено с калибъра на съседно неувредено ниво. Разпределението на фрактурите по сегменти е както следва: торакални $n = 14$ (12.84%), ТЛ $n = 73$ (66.97%) и лумбални $n = 22$ (20.19%). Разпределението на неврологичния дефицит е съответно: Frankel/ASIA A - торакални $n = 4$; ТЛ $n = 7$; лумбални $n = 1$. Frankel/ASIA B-D - торакални $n = 4$; ТЛ $n = 13$; лумбални $n = 2$. Frankel/ASIA E - торакални $n = 6$; ТЛ $n = 53$; лумбални $n = 19$.

ЗАКЛЮЧЕНИЕ

Степента на стеснение на гръбначния канал при взривни тораколумбални и лумбални фрактури показва положителна корелация и е прогностичен фактор за тежестта на непълния неврологичния дефицит (Frankel/ASIA - B, C и D). Пациентите с пълен неврологичен дефицит (Frankel/ASIA - A) не показват такава корелация.

Ключови думи: гръбначни фрактури, торакални вертебрални фрактури, лумбални фрактури, неврологичен дефицит, гръбначна травма, стеноза на спиналния канал.

in thoracolumbar and lumbar burst fractures is not well established and is the subject of much controversy.

METHODS

From 2008 to 2013 a total of $n = 205$ patients with different types of thoracic and lumbar fractures classified by AO/Magerl were admitted in our service. Of these, $n = 109$ (53,17%) were with burst fractures. On these patients was performed measurement of the degree of narrowing of the spinal canal. The measurement technique included the ratio of sagittal diameter of spinal canal at the injury level to that at the adjacent level on axial CT scans and it was compared with the severity of neurologic deficit, classified according to Frankel/ASIA.

RESULTS

The average narrowing of the spinal canal is 35.47% (6/97%) compared to the caliber of the undamaged canal adjacent to the injury level. The distribution of fracture segments is $n = 14$ (12.84%) thoracic, $n = 73$ (66.97%) TL and $n = 22$ (20.19%) lumbar. The distribution of neurological deficit is: Frankel/ASIA A - thoracic $n = 4$; TL $n = 7$; lumbar $n = 1$. Frankel/ASIA B-D - thoracic $n = 4$; TL $n = 13$; lumbar $n = 2$. Frankel/ASIA E - thoracic $n = 6$; TL $n = 53$; lumbar $n = 19$.

CONCLUSION

The narrowing of the spinal canal in thoracolumbar and lumbar burst fractures show a positive correlation between the narrowing of the spinal canal and the severity of the incomplete neurological deficit by the Frankel/ASIA classification. Patients with complete spinal cord injuries (Frankel/ASIA A) did not show this correlation.

Key words: spinal fractures, thoracic vertebrae/injuries, lumbar vertebrae/injuries, neurological deficit, spine trauma, spinal canal stenosis.

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ACUTE EPIDURAL HEMATOMA FORMATION AFTER VENTRICULO-PERITONEAL SHUNT PLACEMENT

Background: Acute epidural hematoma is a common finding of the traumatic brain injury patients. However there are only a few cases of acute epidural hematoma formation after insertion of ventriculo-peritoneal shunt.

Case report: We present a rare case of acute epidural hematoma formation after insertion of ventriculo-peritoneal shunt.

A 28-year old man presenting with one year history of headache, dizziness, difficulties finding words, lower limbs weakness and urinary incontinence was admitted for CSF diversion. MRI investigation revealed excessive dilatation of the all four ventricles. Intracranial pressure measured in recumbent position pre-operatively revealed an ICP of 6mm Hg. The patient was operated and Strata programmable valve was used for the CSF diversion. CT scan on the sixth post-operative day showed an acute epidural hematoma that was evacuated urgently. The postoperative period went uneventfully. Patient was discharged with significant improvement.

Conclusion: Although the formation of subdural hematomas is not rare conditions resulting from the overdrainage of the VPS in the shunted patients with chronic longstanding ventriculomegaly, the acute epidural hematoma formation after VPS insertion is a rare entity. Our case however shows that it could be also expected as a complication among the over drained chronic hydrocephalus patients

Introduction

Subdural hematoma formation is a well known complication of the overdrained chronic longstanding hydrocephalus patients [1, 2]. The reason for that is the long standing ventriculomegaly that dramatically reduces the brain compliance [3]. However there are only a few cases reported of acute epidural hematoma formation after insertion of ventriculo-peritoneal shunt [4, 5].

Purpose: We present a rare case of acute epidural hematoma formation after insertion of ventriculo-peritoneal shunt, in order to prove the possibility of acute epidural hematoma formation due to overdrainage in the long standing chronic hydrocephalus patients.

Methods: The case is presented together with its clinical course, the diagnostic techniques, the surgical findings, and the treatment outcome.

Case report

A 28-year old man presented with one year history of headache, dizziness, difficulties finding words, lower limbs weakness and urinary incontinence. The conversation with his relatives revealed learning difficulties and mental retardation during the childhood. MRI investigation revealed excessive dilatation of the all four ventricles. (Figure 1) Intracranial pressure measured in recumbent position pre-operatively revealed an ICP of 6mm Hg. After clinical discussion it was decided the hydrocephalus to be treated with Strata Adjustable Valve. The valve was intra-operatively set at 1.0. CT scan on the sixth post-operative day showed an acute epidural hematoma (Figure 2) that was

evacuated urgently (Figure 3). The valve was set intra-operatively to 2.0. The postoperative period went uneventfully. Patient was discharged with significant improvement – no headaches and dizziness, improved word finding, improved gait and urinary control, which remained unchanged on the sixth month follow up visit.

Results

After the surgical treatment the patient's complaints were alleviated and no complaints were registered, during the next 6 months follow-up.

Discussion

A multitude of underlying etiological reasons can cause hydrocephalus (HC). Its classification and terminology is still controversial and a widely accepted consensus is still due to be achieved [2, 6, 7, 8].

The pathophysiology of hydrocephalus (HC) first started in the beginning of the previous century with the work of Dandy and Blackfan [9]. In 1913 they had first introduced the term "Internal Hydrocephalus" and also described the main features of the so called Communicating and Non-communicating Hydrocephalus. By 1919 Dandy [10] had developed an experimental animal model in order to study and develop treatment for HC. Since that first classification, there are numerous attempts at HC classifications, reflecting different aspects of the problem, but 100 years after the Dandy's and Blackfan's work, despite the many major achievements led to many classifications covering

TIMING OF OPERATIVE MANAGEMENT IN PATIENTS WITH TRAUMATIC CENTRAL CORD SYNDROME

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ABSTRACT

OBJECTIVES: Patients with traumatic central cord syndrome (TCCS) provide some of the most dramatic opportunities for neurological improvement when compared to other subgroups of SCI, particularly evident in young patients with TCCS. The purpose of this study is to review a series of patients with central cord syndrome and to corroborate the consensus about optimal treatment and surgical timing for decompression.

MATERIALS AND METHODS: Patients developing this suffering belong to two relative categories – the first group are relatively young patients with a high-energy injury that leads to fracture/subluxation or dislocation. The second category are older individuals who, due to a low-energy fall or cervical hyperextension injury present with TCCS that occurs in the presence of cervical spondylosis but without obvious injury to the spinal column. The main tool for refinement of the operative window was ASIA motor score.

RESULTS: Thirty-two patient were divided in two groups – patients with ASIA motor score less than or equal to 50 p. (mean – 42.4 p.) – 10, and patients with a score higher than 50 p. (mean – 67.45 p.) – 22. Patients with ASIA M scores less than 50 p. were operated within 24 hours, but 2 patients from these – within 20 days. Patients with ASIA M score higher than 50 p. underwent decompression within 72 hours. All patients sustained improvement in neurological status with the exception of these two, who underwent late decompression.

DISCUSSION: These cases clearly demonstrate to what range should operative activity be targeted in patients with TCCS. Patients with ASIA M score 80 and above, with MRI fracture evidence and those who may have already experienced significant motor improvement between the time of injury and the moment of initial neurological evaluation, may undergo delayed surgical treatment.

CONCLUSIONS: There was a recommendation based on low-quality evidence that early (as soon as feasible) surgical decompression for patients with TCCS and spondylosis should be recommended when their initial neurological impairment is significant.

Keywords: *traumatic central cord syndrome, spinal cord injury, spinal decompression*

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INTRODUCTION

Traumatic central cord syndrome is the most common incomplete cervical cord lesion and accounts for up to 70% of all incomplete cervical cord injuries (1,2). It is classically described as disproportionately more upper extremity weakness than lower extremity involvement, bladder dysfunction, and variable sensory loss below the involved level (3). Most studies indicate that patients have significant

OUR EXPERIENCE WITH MAGERL'S MODIFIED TECHNIQUE FOR STABILIZATION OF SUBAXIAL CERVICAL SPINE

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Abstract: Aim: There are different surgical techniques for massa lateralis screw instrumentation of subaxial cervical spine — those of Roy-Camille, Magerl, Anderson, and An. Each has different starting point and trajectory of screw implantation. For each technique there is a potential risk to affect vascular and neural structures. In this paper we share our experience in using a modified Magerl's technique for stabilization of subaxial cervical spine.

Method: We present a retrospective study and clinical follow-up of 27 patients operated on the occasion of cervical injury that we have used the modified technique of Magerl. In 8 patients was carried an anterior decompression and stabilization.

Results: In these patients was carried posterior or combined — posterior and anterior stabilization. The posterior fixation was massa lateralis with this modified technique of Magerl with multiaxial screws. With this technique were inserted 160 multiaxial screws and the most common length of the implants were 108 mm (108 from 160 or 67.5%).

Conclusion: Based on world literature, experience and analysis of clinical cases, we believe that this modified technique for subaxial cervical fixation is effective (the pull-out strength approach to the strength of pedicle screw instrumentation) and is much safer.

Key words: Posterior subaxial instrumentation, Magerl's technique, subaxial instability.

INTRODUCTION

Various techniques and instrumentations are available for the posterior stabilization of subaxial cervical spines after extensive decompressive surgery or trauma-related instability. These include wiring, placement of Halifax clamps, and use of various kinds of

screws with plates or rods (1–5) and the combination of hooks and plates (6). Each of these techniques, however, presents its own limitations (7). Wiring is used less and less because it can only be carried out where certain key parts of the posterior element of the subaxial spine are present; therefore, it is impossible in most scenarios where laminectomies have been required for decompression or exposure of target lesions. Moreover, wiring provides less fixation strength in comparison with other rigid instrumentations. Halifax clamps may provide better fixation strength than wiring but are still not optimal. Lateral mass screws with plate fixation require precise contour tailoring for each patient and are thus extremely difficult for practical application. Recently, the use of lateral mass screws fixation in conjunction with rod systems has greatly increased because this technique can avoid the above-mentioned shortcomings. For examples, lateral mass screw fixation can be performed after laminectomies, and it is also applicable in extension to the occiput or the thoracic spines, and in multilevel placement with biomechanical superiority (8, 9). Various authors such as Magerl (6), Roy-Camille (10, 11), Anderson (3), Louis (12), and An (13) have developed different methods of placing screws into the lateral mass. However, each of these methods has carried the risk of potential injury to the neural or vascular structures due to the anatomical variations among different levels of the cervical spine and different patients. To overcome these ongoing problems, we have developed a modified technique to minimize iatrogenic neurovascular injuries while achieve maximal purchase of the screw on the bone. The pathologic features, surgical indications, surgical results, and complications of the 27 patients, treated with the modified techniques, were presented. More than half of the patients treated with skipped level fixation were also presented and discussed.

SURGICAL COMPLICATIONS AND UNWANTED EVENTS IN THE MODERN PERCUTANEOUS VERTEBROPLASTY TREATMENT

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ABSTRACT

AIM: The modern spinal surgery accepts the percutaneous vertebroplasty (PV) with polymethylmethacrylate (PMMA) as a routine procedure for treatment of painful osteoporotic, neoplastic and traumatic compression fractures in the thoracic and lumbar region of the spinal column. Although considered to be a minimally invasive and safe procedure, it could be affected by severe disabling and even life-threatening complications. The aim of the present study is to evaluate the different potential complications with their clinical presentation, diagnostics and different treatment options.

MATERIALS AND METHODS: The study analyzed a cohort of 56 consecutive patients (66 levels) treated with PV in our clinic for the period January, 2008 – July, 2012. Of them, 31 (55.4%) were women and 25 (44.6%) - men at a mean age of 61.7 (23 – 80) years. The osteoporotic and traumatic compression fractures subgroup was comprised of 44 (78.6%) patients, while the patients with neoplastic fractures were 12 (21.4%). All the fractures were classified as A1 Magerl's fractures with no neurologic deficit.

RESULTS: Complications and unwanted events were registered in 9 (16.1%) patients. Of them, 2 experienced transient increased pain syndrome intensity, one of the patients presented with index level radiculopathy, 2 patients were diagnosed with extravertebral leakage of the cement in the spinal canal with compression of the neural structures and subsequently operated, 1 patient had a cement leak in the adjacent disk, 2 patients – a cement leak in the paravertebral soft tissues and the paravertebral venous system, and one had cement pulmonary embolism.

CONCLUSION: PV is a minimally invasive and effective procedure that is used in the treatment of painful osteoporotic, traumatic and neoplastic compression fractures on neurologically intact patients. The clinically significant complications and unwanted events are a relatively rare encounter and in the majority of the cases are treatable with conservative measures. The epidural cement migration with neural elements compression is the only indication for surgical decompression and removal of the compressing cement.

Keywords: percutaneous vertebroplasty, complications, polymethylmethacrylate, treatment, clinical presentation, osteoporotic fractures

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INTRODUCTION

The percutaneous vertebroplasty (PV) with polymethylmethacrylate (PMMA) is a minimally invasive surgical procedure that has been widely used during the last decades for the treatment of painful osteoporotic fractures, pathologic neoplastic fractures (myeloma, lymphoma, hemangioma, metas-

CONTEMPORARY SURGICAL TREATMENT OF THE OSTEOPOROTIC COMPRESSION FRACTURES

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ABSTRACT

AIM: The vertebral compression fractures (VCF) are among the most common complications of osteoporosis that could be a cause for permanent and debilitating pain, restricted mobility and hence - significant worsening of the quality of the life. The surgical treatment of VCF is indicated after a failure of the conservative treatment or after established spinal instability or neurological deficit. The most commonly used surgical procedures are the percutaneous vertebroplasty with polymethyl methacrylate (PMMA) and the transpedicular screw fixation-reconstruction. The aim of the present investigation is to summarize and elucidate the indications for the different types of spinal techniques, the potential complications and their treatment.

MATERIALS AND METHODS: 72 consecutive patients with compression spinal osteoporotic fractures treated in our clinic from January, 2009 to July, 2012 were analyzed. Of these, 38 patients (M14 / F24) at an average age of 66.8 years (54-80) underwent PV on 46 levels. All the fractures were without neurological deficit and classified as A1 type in Magerl. The remaining 34 patients (M5 / F29) at an average age of 67.3 years (56-85) underwent transpedicular screw spinal reconstruction addressing incomplete burst compression fractures in which the anterior two columns were damaged. A total of 40 levels were addressed. The indications for surgery were severe pain syndrome, neurological deficit, presence of bone fragments in the spinal canal or spinal instability.

RESULTS: In our series the VCF are most commonly located in the thoracolumbar (Th11-L2) segment of the spine - 75.6%, (65/86) levels. In 7 patients 2 levels were treated in one settings, 2 patients had 3 levels treated and one patient 4 levels. Our PV subgroup showed very good outcome in 84.2% (32/38) of the patients. Due to migration of the cement in the spinal canal, two patients underwent surgical decompression. The results in the spinal instrumentation subgroup are good in 82.4% (28/34) of the cases. In 6 of the instrumented cases a revision surgery was performed, due to progressing neurological deficit and persistent pain. The surgery addressed screw pull-outs and implant malposition/displacement.

CONCLUSION: Our results indicate that modern surgical treatment of osteoporotic patients with symptomatic VCF presents low incidence of complications and allows for a significant reduction of pain, spinal stability, improved quality of life and prolonged active life. PV is a minimally invasive procedure with a good effectiveness and uncommon complications that are clinically significant. The spinal instrumented reconstruction is indicated in cases of severe multilevel VCF, spinal instability, and compression of the neural structures.

Keywords: spinal instability, osteoporosis, complications, vertebroplasty, screw pull-out

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BACKGROUND

Osteoporosis is a systemic disease affecting mainly elderly patients. It is characterized with a reduction of bone density and impairment of the micro architectonics of the bone tissue and as a result of the above, low energy compression fractures tendency

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BACKGROUND

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АНАЛИЗ НА ЕФЕКТИВНОСТТА НА РАЗХОДИТЕ ЗА МЕХАНИЧНА ТРОМБЕКТОМИЯ СЪС СТЕНТ-РЕТРИВЪР ЗА ЛЕЧЕНИЕ НА ОСТЪР ИСХЕМИЧЕН ИНСУЛТ В БЪЛГАРИЯ

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Резюме. Издирени са и са анализирани публикувани данни от оценки на здравната технология механична тромбектомия (МТ) при пациенти с остър исхемичен мозъчен инсулт. Извършено е моделиране на констатираните в проучванията по темата разходи и здравни ползи от МТ като добавка към интравенозна тромболиза чрез използване на тъканен активатор на плазминогена (IV-tPA) в сравнение с монотерапия IV-tPA за лечение на целевата група пациенти. Входящите данни в модела са оценените резултати за ефикасност и безопасност на МТ + IV-tPA в клиничните изпитвания THRACE и SWIFT PRIME. Резултатите от анализа на ефективността на разходите на МТ + IV-tPA в сравнение с IV-tPA са представени като инкрементално съотношение (ICER) на допълнителни здравни разходи (Δ costs) и допълнителни здравни ползи (Δ QALY). В заключение може да се каже, че МТ + tPA е разходно ефективна здравна технология в сравнение с IV-tPA (ICER 16 800 лв./QALY) от гледна точка на препоръчания от СЗО максимален праг за ефективност на разходите, представляващ стойността на трикратно увеличения брутен вътрешен продукт на човек от населението за предходен едногодишен период.

Ключови думи: тъканен активатор на плазминоген, механична тромбектомия, остър исхемичен инсулт/лечение

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COST-EFFECTIVENESS ANALYSIS OF MECHANICAL THROMBECTOMY WITH STENT RETRIEVER FOR TREATMENT OF ACUTE ISCHEMIC STROKE IN BULGARIA

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Abstract. Published data from evaluations of mechanical thrombectomy (MT) health technology in patients with acute ischemic stroke was identified and analyzed. Modeling of the ascertained in studies relevant costs and health benefits of MT as an adjunct to intravenous thrombolysis through the use of tissue plasminogen activator (IV-tPA) for treatment of the target patient group. Input data in the model are evaluated results for efficacy and safety of MT + IV-tPA in the THRACE and SWIFT PRIME clinical trials. The results from analysis of the cost-effectiveness of MT + IV-tPA in comparison with IV-tPA are presented as incremental ratio (ICER) of additional health costs (Δ costs) and additional health benefits (Δ QALY). In conclusion, MT + IV-tPA is a cost-effective health technology in comparison with IV-tPA (ICER BGN 16,800/QALY) from the point of view of the WHO recommended maximal cost-effectiveness threshold representing the amount of three times increased gross domestic product per capita for previous one-year period.

Key words: tissue plasminogen activator, mechanical thrombectomy, acute ischemic stroke/treatment

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ПОЛЗИ ОТ БЪРЗОТО ВЪЗСТАНОВЯВАНЕ НА ПАЦИЕНТИТЕ ОТ НЕВРОМУСКУЛНА БЛОКАДА СЛЕД НЕВРОХИРУРГИЧНО ЛЕЧЕНИЕ – АНАЛИЗ РАЗХОД/ПОЛЗА

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BENEFITS FROM THE FAST RECOVERY OF PATIENTS FROM NEUROMUSCULAR BLOCKING AFTER NEUROSURGICAL TREATMENT: A COST-BENEFIT ANALYSIS

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Резюме:

Цел на изследването е моделиране на ползите от бързото възстановяване от невромускулна блокада (НМБ), изразени като спестени разходи за персонал и добавени доходи от използването на операционните зали за периода, представляващ разликата между времето, необходимо за спонтанно възстановяване, и времето за възстановяване от НМБ след приложение на sugammadex (SUG). Проведен е икономически анализ от типа разход/полза и е изчислена стойността на възможната нетна парична полза за лечебното заведение от бързото възстановяване от НМБ. Резултатите показват, че по-бързото възстановяване на пациентите от невромускулна блокада след неврохирургично лечение със SUG в сравнение със спонтанното възстановяване допринася за нетни икономически ползи за лечебното заведение в размер на 193,82 лв./пациент при дълбока и 110,63 лв./пациент при умерена невромускулна блокада. Изчислените икономически ползи от приложението на SUG могат да бъдат реализирани в пълен обем само в лечебни заведения с интензивна хирургична дейност, при които оптимизираното използване на операционните зали би довело до реални ползи.

Ключови думи:

невромускулна блокада, sugammadex, анализ разход/полза

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Abstract:

The study aim is to model the benefits from the fast recovery from neuromuscular blocking (NMB), which are presented as the saved costs for personal and added income from the use of operating rooms for the period, which consists of the difference between the time required for spontaneous recovery and the time for recovery from NMB after the administration of sugammadex (SUG). The type of economic cost-effectiveness analysis was performed and the amount of a possible net monetary benefit for the medical center from the fast recovery from NMB was calculated. The results show that a faster recovery of patients from neuromuscular blocking after neurosurgical treatment with SUG compared with spontaneous recovery contributes to net economic benefits for the medical center, amounting to BGN 193.82/patient in a deep NMB and BGN 110.63/patient in the moderate NMB. The calculated economic benefits from administration of SUG can be realized in full volume only in medical centers with intensive surgical activity, where optimized use of operating rooms will lead to real benefits.

Key words:

neuromuscular blocking, sugammadex, cost-effectiveness analysis

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Research Article

Extreme-Lateral Lumbar Interbody Fusion (XLIF) with Intraoperative Neurophysiological Monitoring - A Safe and Minimally Invasive Surgical Approach to the Anterior Lumbar Spine

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ABSTRACT

Aims: Minimally invasive surgical approaches to the spine continue to evolve. We describe here the technique and the results of a recently developed minimally invasive surgical approach to the lumbar spine, the extreme-lateral lumbar interbody fusion (XLIF) approach.

Methods: The XLIF approach to the anterior lumbar disc space allows for complete discectomy, vertebral body distraction, large graft placement, and disc height restoration. It achieves these goals with minimal trauma to the surrounding tissues. The psoas muscle is traversed with a minimum of trauma, and the lumbosacral plexus is protected by the use of intraoperative real-time electromyography (EMG) neuromonitoring.

Results: A group of 31 patients with degenerative lumbar disease, metastatic tumors to the spine, or with spondylodiscitis have undergone XLIF in combination with percutaneous transpedicular screw fixation. All patients have experienced improvement of low back pain and most have improved neurologically. No procedure-related severe side effects or complications have been encountered. There was no permanent nerve damage to the lumbosacral plexus.

Conclusions: This study demonstrates that the XLIF approach for anterior lumbar fusion is a safe and minimally invasive surgical technique, which avoids significant intraoperative blood loss and has no major intraoperative or postoperative complications and side effects. The XLIF approach allows for a wide and very convenient surgical access to the anterior lumbar disc space without the potential complications of a trans-abdominal procedure.

Keywords: Lumbar spine, Extreme lateral anterior lumbar interbody fusion, Lumbar disc disease, Neuromonitoring

Introduction

Lumbar interbody fusion (LIF) has been well established over the last decades as a surgical treatment for a range of spinal disorders, including degenerative disc disease, traumatic injuries,

spondylodiscitis, and primary or metastatic tumors. LIF involves the placement of an implant within the intervertebral space after discectomy and endplate preparation, often combined with posterior transpedicular screw and rod fixation [1]. Currently, LIF is performed using a few main surgical approaches; posterior lumbar interbody



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СЪДЪРЖАНИЕ

ОРИГИНАЛНИ СТАТИИ

- Т. Веков, Д. Харитонов, С. Кондов и Д. Трендафилова.* Анализ на ефективността на разходите за ендоваскуларно в сравнение с хирургично лечение на руптурирали интракраниални аневризми..... 3

ОБЗОРИ

- М. Варадинова, Р. Методиева и Н. Бояджиева.* Невровъзпаление – механизми, асоциирани състояния и фармакотерапия 11
- Е. Харитов, В. Кирков, М. Киркова, К. Колева, Т. Добрева и К. Нацов.* Механизми и ефекти на средата за живот върху ЦНС и психичните заболявания 24
- Е. Харитов, В. Кирков, М. Киркова, К. Колева, С. Клисарски, Л. Спалета и К. Нацов.* Метаболитни и невропротективни механизми на кетогенната диета 36

НЕВРОЛОГИЯ И ПСИХИАТРИЯ 1/2019

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**АНАЛИЗ НА ЕФЕКТИВНОСТТА НА РАЗХОДИТЕ
ЗА ЕНДОВАСКУЛАРНО В СРАВНЕНИЕ С ХИРУРГИЧНО
ЛЕЧЕНИЕ НА РУПТУРИРАЛИ ИНТРАКРАНИАЛНИ АНЕВРИЗМИ****Т. Веков¹, Д. Харитонов², С. Кондов² и Д. Трендафилова²**¹Факултет по фармация, МУ – Плевен²УМБАЛ „Сърце и мозък“ – Плевен

Резюме. Лечението на интракраниалните аневризми съгласно съвременната клинична практика включва ендоваскуларна емболизация (endovascular coiling, EC) и хирургично лечение (surgical clipping, SC). Цел на изследването е идентифициране и анализ на публикувани данни от оценка на ендоваскуларна емболизация на руптурирани интракраниални аневризми; моделиране на разходите и здравните ползи на EC в сравнение със SC. Резултатите от анализа разход/ефективност показват, че EC не е разходно ефективна здравна технология в сравнение със SC (ICER 18 000 лв./QALY) от гледна точка на препоръчания от СЗО максимален праг за ефективност на разходите, равняващ се на трикратно увеличения брутен вътрешен продукт на човек от населението за едногодишен период. Съществува вероятност над 61% здравната технология EC да бъде разходно ефективна в сравнение със SC само при хипотеза, че цената на имплантите, използвани за EC, бъде намалена с 40%. Резултатите от настоящата оценка на алтернативите за лечение на руптурирани интракраниални аневризми се потвърждават от оценките на същите технологии, проведени в САЩ, Южна Корея и Иран.

Ключови думи: руптурирани интракраниални аневризми, ендоваскуларна емболизация, хирургично лечение, анализ разход/ефективност

**ANALYSIS OF THE EFFECTIVENESS OF COSTS
FOR ENDOVASCULAR COILING VERSUS SURGICAL CLIPPING
OF RUPTURED INTRACRANIAL ANEURYSMS****T. Vekov¹, D. Haritonov², S. Kondov² and D. Trendafilova²**¹Faculty of Pharmacy, Medical University – Pleven²UMHAT "Heart and Brain" – Pleven

Abstract. Treatment of intracranial aneurysms as per current clinical practice includes endovascular coiling (EC) and surgical clipping (SC). The aim of the study was to identify and analyze published data from assessments of endovascular coiling of ruptured intracranial aneurysms; modeling of costs and