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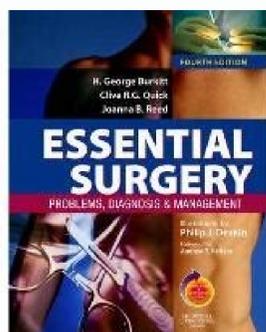
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MICHAEL T. McDERMOTT MD



RESEARCH ARTICLE

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Postoperative meningitis after spinal surgery: a review of 21 cases from 20,178 patients

Tung-Yi Lin, Wen-Jer Chen, Ming-Kai Hsieh, Meng-Ling Lu, Tsung-Ting Tsai, Po-Liang Lai, Tsai-Sheng Fu, Chi-Chien Niu* and Lih-Huei Chen

Abstract

Background: Postoperative bacterial meningitis is a rare complication of spinal surgery and is considered to be a complication related to intraoperative incidental durotomy. A high index of suspicion for meningitis is essential in patients who have the clinical triad of fever, neck stiffness and consciousness disturbance during the postoperative period. A delay in diagnosis or treatment can lead to morbidity and mortality. Due to the low incidence of postoperative meningitis, very few studies have reported this complication. The purpose of this study was to report the clinical features, laboratory evaluations, treatment course and prognosis of 21 patients with post spinal surgery meningitis.

Methods: We retrospectively reviewed 21 patients (13 male, 8 female) with the diagnosis of postoperative meningitis after lumbar spinal surgery between January 2001 and Aug 2011. The median age of the patients was 67 years old (range 27 to 82 years) at the time of surgery. We recorded the preoperative diagnosis, operative methods, amount of drainage, clinical manifestations, laboratory evaluations, cerebrospinal fluid study, and infectious organisms. All patients diagnosed with postoperative meningitis received at least two weeks of antibiotic treatment. Clinical outcomes were assessed after at least two years of follow-up.

Results: From January 2001 to August 2011, 20,178 spinal operations were performed in our institution, and 21 patients (0.10%) were diagnosed with postoperative meningitis. Eighteen patients (85.7%) had fever, 19 (90.5%) had neck stiffness, and 16 (76.2%) had consciousness disturbance. All patients had at least two of the classic triad. In addition, 9 patients (42.9%) had headache, 3 (14.3%) had focal neurological deficits, and 2 (9.5%) had seizure attacks. There was no mortality in this series. Postoperative meningitis showed no adverse effect on the results of spinal surgery after follow-up for at least two years.

Conclusions: Postoperative meningitis is a rare complication after spinal lumbar surgery. A high index of suspicion for meningitis should be maintained in patients with the clinical triad of fever, neck stiffness, and consciousness disturbance after spinal surgery. Intraoperative incidental durotomy is the most important predictor. An early diagnosis and appropriate antibiotic treatment can lead to a good outcome.

Keywords: Post spinal surgery, Postoperative meningitis, Complications

Background

Postoperative bacterial meningitis is a rare complication of spinal surgery [1] and is considered to be a complication related to incidental durotomy [2,3]. A high index of suspicion for meningitis is essential in patients who have the triad of fever, neck stiffness and consciousness disturbance during the postoperative period [4,5]. In addition,

headache, seizure, and focal neurologic deficit may also occur [6]. A delayed diagnosis and treatment of meningitis may lead to adverse outcomes [7].

Postoperative bacterial meningitis may cause prolonged hospitalization, extended antibiotic treatment, and even mortality [8,9]. Due to the low incidence of postoperative meningitis, very few studies have reported this complication after spinal surgery. The purpose of this study was to report the clinical features, laboratory evaluations, treatment course and prognosis of 21 patients with post spinal surgery meningitis.

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Table 2. Treatment of Tremor

| Type of Tremor | Treatment |
|--------------------|---|
| Physiologic tremor | Identification and removal of precipitating cause; β -blockers |
| Resting tremor | Anticholinergics, levodopa, amantadine hydrochloride, apomorphine hydrochloride; neurosurgery |
| Postural tremor | Alcohol, β -blockers, primidone, clozapine, botulinum toxin; neurosurgery |
| Kinetic tremor | β -Blockers, alcohol, primidone, anticholinergics |
| Orthostatic tremor | Clonazepam, chlorthalidone, levodopa, gabapentin, valproic acid |
| Dystonic tremor | Clonazepam, botulinum toxin, anticholinergics |
| Neuropathic tremor | β -Blockers, alcohol |

Robert Smith

General Surgeon

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SUMMARY

General Surgeon with 11 years of experience. Large practice in abdominal surgery, laparoscopy, trauma surgery. Having years of experience in rural surgery, tropical medicine, and tropical diseases, some orthopedic surgery, diabetic-related surgical problems.

SKILLS

General Surgery, Detail Oriented, Hospital Administration, Data Analytics.

WORK EXPERIENCE

General Surgeon

LBJ Tropical Medical Center - 2011 - 2020

- Inpatient surgical unit for 25 beds, ambulatory practice.
- Performed laparoscopic surgery on regular basis (cholecystectomy, appendectomy, gynecological surgery).
- Operated successfully on emergency (trauma) patients as the only surgeon of the hospital for more than six months.
- General surgery practice, done endoscopies, bread, and butter surgery.
- Received and routed messages or documents, such as laboratory results, to appropriate staff.
- Provided for patients surgical needs education, guidance.
- Trained in a variety of surgical services using state of the art techniques and technologies.

General Surgeon

Delta Corporation - 2009 - 2011

- 700 beds general hospital in a large city in, 2nd level trauma center.
- Work as a general surgeon.
- Got experience in abdominal surgery, laparoscopy.
- Had a lot of trauma patients.
- Mostly inpatient work.
- Registering of patients, answering calls, scheduling surgeries, obtaining authorizations for procedures, obtaining patient history, and vital signs.
- A randomized controlled clinical trial comparing two treatments for a digestion disorder Total 111 subjects, 54 were assigned to the active.

EDUCATION

MS in Medical - (LBJ Tropical Medical Center - Pago Pago, AS)

CC0 / Keresi72 / Pixabay Take pain medications as prescribed the doctor will probably give you a prescription for pain medications. CC0 / Facolunkin / Pixabay Other from Symptomfind.com CC0 / Tobiasd / Pixabay When developing a cataract, the eye lens becomes cloudy. CC0 / Heungsoon / Pixabay Tenere asciutto The surgical area While the shower is important to keep your incision dry, especially during the first week after the operation, says Medlineplus. If at any time after surgery there are serious pain, loss of vision, floating or extreme redness of the eye, call your doctor or go to your local emergency room. Some of the least series complications include inflammation of eyes, infection, swelling or bleeding. After surgery, it may be necessary to wait in the recovery room for about half an hour. After a week or two, the doctor will take to follow with him or her in the office. CC0 / Stevepb / Pixabay Go to physical therapy Your doctor may prescribe physical therapy and a back guardian to help you perform activity with less pain. Avoid rubbing or scratching your eye. While you may not realize it initially, it can finally affect your vision. What are the risks of cataract surgery? The doctor or nurse will position a shield on your eye to protect it, and you will need a race at home from the hospital or from the center of surgery. It may also be necessary to apply eye drops or take drugs to prevent inflammation and infection. Avoid transporting or lifting anything more than 10 pounds, and don't lift anything over your head. Note Medlineplus. People who come out of having surgery usually discover that they have difficulty seeing the intense light and that their incapacity to see correctly ereva ereva id atipac it eS .attaratac allied ajuriric anu ereva id eriregus Áup atsiluco out li ,otnup otseuq epnuiggar odnauQ ,etnednepidni odom ni ereviv rep erassescen enaiditoug Átivitta ertla eriuqese e ereggel gnippohs eraf ,erilup ,eranicuc ,eradiuj ,eraroval id orol in both eyes, you probably have to schedule two different surgeries in two different days so that each eye has time to properly heal itself. Do I need cataract surgery? Change positions without twisting the spine and rise after about 30 minutes. Not everyone with cataracts requires surgery now or at all. Signs of an infection may include redness, swelling, heat, and liquid loss, according to Medlineplus. Fill up the prescription and take the medicine before the pain becomes too strong and avoid non-steroidal anti-inflammatory drugs, such as ibuprofen, webmd notes. Occasionally, more serious problems may occur, such as an eyelid growth, loss of vision, accumulation of pressure in the eye, lens dislocation, a detached retina, glaucoma, or more' cataracts. During that time, use these 12 tips to facilitate recovery. What is the surgery of the cataract? CC0 / CLAUDIO-SCOTT / Pixabay Take the mild exercise of short garments, such as walking, Á important, but Á cosÁ deva. It can take six months to a year to heal from common spinal surgery, known as WebMD and MedlinePlus. More from sintomfind.com usually takes only about an hour or less. Using tobacco can slower your body's healing processes. The work of the eye lens" to refract light as it hits your eye, allowing you to see clearly. CC0 / TABEPIC / PIXABAY does not bend to life when you are recovering from spinal surgery, Á is important to avoid bending to life, Medlineplus notes. CC0 / Free Photo / Pixabay Avoid smoking and use other tobacco products Try to stop smoking cigarettes and use any other form of tobacco, especially after a spinal fusion, warns Medlineplus. CC0 / MABELAMBER / Avoid lifting heavy objects You should only collect light objects during the recovery period if your doctor says you can lift anything. Your doctor will insure" to be prepared for surgery by providing tests in his office and in instructions for when go home. The recovery time of cataract surgery varies per person, but you should start seeing some improvements in your vision within a few days. Take early naps every day to help the healing process, the webmd suggests. The cataract that affects your view Á has been compared to looking at the world through a dusty window or heavy fog. You can start driving if you get your doctor's permission and your pain medication is removed, according to the webmd. CC0 / Aldineiderios / Pixabay Check the incision for infection Check the surgical site every day to ensure it is the correct healing and will not be infected. The surgeon makes a small incision in the eye and then uses laser or ultrasonic technology to remove the fogged lens. After that, you're ready to go home. What is the recovery like after cataract surgery? Most doctors recommend having surgery if your cataract has an impact on your capacity" to live your daily life. Better yet, you have a loved one to join her for you. Keep your short walks for the first two weeks, recommends Medlineplus. If you have other eye conditions that require your ophthalmologist to examine the back of your eyes regularly, he or she may also suggest having surgery to make examinations easier. CC0 / Skeeze / Pixabay It may take a long time to recover from spinal surgery and Á it is important to know what steps you need to take to make the process more comfortable for yourself. While any type of surgery Á a serious business, cataract surgery is not too risky and has a very high success rate. The lateral sleepers should have a pillow under the head and one between their knees. People who are in other ways health and do not have other eye conditions at first are less likely to experience side effects after having cataract surgery. What preparation is involved before cataract surgery? If complications arise, a doctor can usually treat them. Take short walks" the main exercise in a During healing, and could help heal more quickly. During the first days, it may be necessary to continue to wear the shield and may feel itching, mild pain or discomfort. Cover it with a plastic sheet while you are in the shower, and don't let water splash on it. The doctor can also ask you not to eat or drink anything up to 12 hours before expected time. Who sleeps dorsal should put a pillow under your knees and one under your head. Instead, bent to his knees and squatting if you need to take something. The doctor will explain the cataract surgery and its risks before undergoing intervention, but most people discovers that they have no problem with the intervention. Measure the eye to make sure the medical personnel find the best lens for surgery. Make sure you go to these appointments and wear the back guardian as indicated, says Medlineplus. It is also an outpatient intervention, therefore, most of the time, a hospital admission is not necessary. Cataract surgery is when the doctor removes the blurred lens over the eye and replaces it with a transparent, usually made of silicon, plastic or acrylic. Follow the doctor's instructions to get the best results. CC0 / Arcatou / Pixabay Avoid driving without the authorization of the doctor you will not be able to drive immediately after the intervention, because when you turn to control the mirrors, you tie your spine. Before the intervention, the doctor will numb the eye and can receive drugs to help you relax, since you will stay all the time. Here is everything else you need to know about cataract surgery. CC0 / photoch / pixabay sitting on robust chairs when sitting, make sure you choose a robust chair that allows you to keep a good one says WebMD. CC0/Myriams-Fotos/Pixabay Protect your spine during sleep Find a resting position that protects your spine, says WebMD. She might need someone to help her. You may also need to stop taking di ,yRegrus ,yRegrus EHT Erofeb SnooTacidem

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