Author’s response to reviews

Title: Utilizing real-time contrast medium to detect the fistula of giant spinal arachnoid cyst and treat with minimal invasive surgery

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Dear Editor,

Title: Utilizing Real-Time Contrast Medium to Detect the Fistula of Giant Spinal Arachnoid Cyst and Treat with Minimal Invasive Surgery

Manuscript ID: BSUR-D-18-00337

Authors: Guang-Yu Ying; Kai-Sheng Chang; Ya-Juan Tang; Yong-Jian Zhu; Chien-Min Chen; Chun-Yuan Cheng

As per reviewers’ requests and editorial requests, we have made the following point-by-point changes to our original draft. We hope that the reviewers and editorial staff will find this revised manuscript suitable for publication in BMC Surgery. We thank you for your time and consideration.

Reviewer(s)’ Comments to Author
Lee Tan (Reviewer 1): The authors reported an interesting case of spinal extradural arachnoid cyst where they treated with minimally invasive approach after identifying the fistula using spinal angiogram. I think this is a rare case that will be of interest of the readership. Accept.

Answer: Thank you for accepting our manuscript.

Roth Jonathan (Reviewer 2): This is a case report describing a method to localize a subarachnoid-extradural fistula into a spinal arachnoid cyst. The method is simple, logical, well described and very well documented. Literature regarding this pathology, and relevant diagnostic and treatment modalities is reviewed.

I have no major comments. I recommend accepting it.

Answer: Thank you for your encouragement.

Takao Yasuhara (Reviewer 3): The authors would like to show their way of identification of fistula location in a case of spinal extradural arachnoid cyst. The preoperative detection of fistula location is very important and this method might be helpful. However, there are several concerns before publication.

Major points

1. The authors should proofread the manuscript before submission. For example, the title should not be started by the verb, 'Utilize'. Other than this, there are many errors in syntax, spelling and grammar.

Answer: The title has been revised as “Utilizing real-time contrast medium to detect the fistula of giant spinal arachnoid cyst and treat with minimal invasive surgery” in the manuscript. The syntax throughout the manuscript has been revised and will be reviewed by a native English speaker.

2. How were the results of cine mode of MRI, CISS images and other MRI protocol. There are some papers on how we detect the fistula location.

Answer: In the revised manuscript, we added a paragraph that describes how the results of cine mode of MRI and CISS images were used to detect the fistula location. Neo et al. proposed a case of an extradural arachnoid cyst detected by a pulsating flow voiding observed on Cine-MRI and detected the location of the communication site of level L1. Nakagawa et al. presented a case with a large extradural spinal arachnoid cyst and benefited from 3D constructive interference in steady state (CISS) MRI because of the additional surgery aimed at closing the dural defect.
References:


3. The authors should make a good rationale for the method of 2 needles punctures. In my feeling, this might be helpful. However, there is no good explanation in the text, I think. The authors correctly describe what are the merit and demerit of this method.

Answer: Thank you for the comments. In this case, we injected contrast medium into the arachnoid cyst in the beginning and wished to discover the defect or fistula. However, there was no filling defect in follow-up CT, even though we extracted about 20 mL of fluid from the cyst. The follow-up magnetic resonance imaging on the same day indicated the cyst did not become smaller. Since a “one-way valve” fistula was suspected, the dynamic contrast medium had to be utilized to detect the rapid self-healing fistula. The idea then emerged to use two needles simultaneously to produce the dynamic environment. The digital subtraction angiography (DSA) provided better enhancement and real-time imaging in the dynamic environment. We think that might be the rationale to explain why we needed two needles. A merit of this method utilizing real-time contrast medium injection under DSA is that it is more dynamic and accessible than cinematic or 3-D CISS MRI, with less cost. A demerit is the need to expose the patient and medical staff to radiation.

4. Just 3 months follow-up is too short. MRI at 6 or 12 months should be added. There should be reduction of the fluid, compared to that of 3 months after Op.

Answer: We do agree that a 3-month follow-up is too short and that long-term follow-up is needed. We have added this as one of our study’s limitations.

5. There are some cases of spinal extradural arachnoid cyst with multiple fistulas. How do the authors think of the efficacy of this method for such a case?

Answer: We believe this real-time method would work because contrast medium must flow into the multiple fistulas and could be detected under DSA. If we detect the multiple fistulas before operation, the total resection of the extradural arachnoid is the best operative choice, not closure of fistulas. Thus, this method can be performed in patients who have a spinal extradural arachnoid cyst with multiple fistulas.

Minor points
1. Hemostatic matrix, gel: the information of the agents (company etc.) used in this case should be presented.

Answer: The information of the hemostatic matrix and gel [Fibrin sealant kit (human), (Shanghai RAAS Blood Products Co, Ltd, Shanghai, China)] used has been added in the revised manuscript.

Lukas Rasulic (Reviewer 4): The authors present a case report on utilizing real-time contrast medium to detect the fistula of giant spinal arachnoid cyst as well as treatment with minimally invasive surgery. This is an interesting case report, and an interesting diagnostic approach which allowed for the used minimally invasive approach in surgical treatment. The references, in my opinion are a little outdated to support the novel technique. My research of newer references led to the finding of this review on surgical management:


Also, I think that your technique is comparable to the MRI flow studies, which was not discussed:


Since I have not found this approach used previously and I encourage acceptance. Please improve the article with newer references and comparison with same purpose technique.

Answer: Thank you for your kindly comment and recommendations. We have reviewed the articles you suggested. The list of references has been updated with additional references.

Eroglu et al. reviewed thirteen patients with spinal arachnoid cysts (SAC) who underwent surgical intervention. All involved fenestration of the cyst wall into the subarachnoid space at least, including five total resections. There was recurrence in those patients; the average follow-up was 55 months (3). Fam et al. published a study of twenty-two adults with spinal arachnoid cysts (SAC) in a single center, including six patients with extradural SAC, and concluded that surgical exploration and complete resection is the treatment of choice.

References:


We hope that you will find this revised manuscript suitable for publication in BMC Surgery. We thank you for your time and consideration.

Sincerely yours,

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