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Name of Journal: *World Journal of Orthopedics*

ESPS Manuscript NO: 24466

Manuscript Type: Case Report

All the reviewers' comments have been addressed. The changes in the manuscript have been underlined.

Reviewer # 1

Thank you for your comments.

This article is a case report of hemorrhagic lumbar synovial facet cyst secondary to transforaminal epidural injection. I think it is useful to know this complication for patients with such pathology.

Reviewer #2

Thank you for your comments.

It is a well presented report. However, the main problem with the report is that there is no way of being certain that it was the epidural needle which caused the hemorrhage in the synovial cyst. Hemorrhagic synovial cysts have been described in patients without epidural injections and they can present in an acute or subacute manner. Ref (Orthopedics. 2012 Sep;35(9):e1457-60. doi: 10.3928/01477447-20120822-41. Spontaneous hemorrhage in an upper lumbar synovial cyst causing subacute cauda equina syndrome.)

Page 5, lines 18-21: The authors agree with the reviewer that there is a previous report of spontaneous hemorrhage without epidural injection. However, in the current case report, the timing of the presenting symptoms supports the thought that introduction of a needle into a pre-existing synovial cyst had led to subsequent intra-cystic hemorrhage and onset of radicular symptoms and weakness.

Reviewer # 3

Thank you for your comments.

In this article, the authors present the case of a 64-year old female who presented with foot weakness and radicular pain after a transforaminal epidural steroid injection. MRI revealed a hemorrhagic cyst, and the patient was treated with decompression and cyst excision. Although the work is interesting, there are several possible improvements that could be made

1. Although hemorrhagic cysts after injection may have not been reported previously, there have been cases of hemorrhagic cysts, and it may be worthwhile to include a brief review on the matter (Xu et al. hemorrhagic synovial cyst: the possible role of initial trauma and subsequent microtrauma in its pathogenesis. Neurosurgery 2011)

Page 5, lines 18-21: The authors agree with the reviewer that there is a previous report of spontaneous hemorrhage without epidural injection. However, in the current case report, the timing of the presenting symptoms supports the thought that introduction of a needle into a pre-existing synovial cyst had led to subsequent intra-cystic hemorrhage and onset of radicular symptoms and weakness.

2. Was instrumentation used? Although the case report sections mentions “the goal was... and instrumented fusion for the degenerative changes” there is no further mention of this, either in the manuscript or abstract...

Page 2, lines 26 and page 5 line 2-3: Patient had L3-S1 instrumentation and posterolateral fusion for the degenerative lumbar spine disease and spondylolisthesis.

3. It is recommended the authors comment on the benefits of surgical decompression alone vs. instrumented fusion. It has been argued by some that fusion decreases the risk of cyst recurrence (Bydon A et al. recurrent back and leg pain and cyst reformation after surgical resection of spinal synovial cysts: systematic review of reported postoperative outcomes. Spine J. 2010), but others argue decompression alone may be sufficient (Epstein et al. the diagnosis and management of synovial cysts: efficacy of surgery versus cyst aspiration. Surg Neurol Int, 2012)

Thank you for this comment. This point has been added to the discussion.

Page 6, lines 9-24: The role of fusion at the time of cyst excision and decompression remains controversial in patients displaying preoperative spondylolisthesis. The need for fusion is influenced by symptomatic preoperative instability as evidenced by dynamic radiographs or intraoperative instability that may be created by iatrogenic resection of spinal structures such as the pars interarticularis or the facet joints [3]. Epstein et al. treated 80 patients with cyst excision and decompression without fusion. Thirty-five patients demonstrated preoperative Meyerding grade 1 spondylolisthesis. At two years follow up, 58% of patients who had no evidence of preoperative spondylolisthesis and 63% of patients with preoperative spondylolisthesis demonstrated good or excellent surgeon based outcomes. However, a moderate improvement was noted in only 2 of 8 SF-36 measures. Eleven patients had progression of listhesis and two patients required surgical stabilization [9]. Bydon et al. in a systemic review noted that 811 patients (84%) underwent decompressive excision alone while 155 patients (16%) had concomitant fusion. They reported that 6.2% of the patients required further operative intervention, the majority of which were for instability and mechanical back pain. Additionally, they found that cyst recurrence occurred in 1.8% of patients who underwent decompression alone while no cases of recurrent cysts were found in patients who underwent fusion [10].

Reviewer # 4

Thank you for your comments.

IT IS AN INTERESTING CASE REPORT. HOWEVER WITH SEVERAL INCONSISTENCIES:

1. Information about the patients' clinical picture prior to ESI is not provided in the paper (did she have any neurological symptoms previously, and did they just worsen?).

Patient complained of low back pain without radicular pain or weakness before the transforaminal ESI.

2. What was the indication for a L5-S1 transforaminal ESI (why not a median ESI through the sacral hiatus)?

Page 4, lines 2-3: The authors did not perform the injection. The patient was referred to the authors' clinic from a pain management physician who performed the injection after she developed radicular pain and progressive weakness.

3. MRI pictures prior to ESI are missing (she might have had a synovial cyst before that?).

The authors did not perform the injection. The patient was referred to the authors' clinic from a pain management physician who performed the injection after she developed radicular pain and progressive weakness. She did not have MRI immediately prior to the transforaminal ESI. Review of the patient records showed that she had MRI 2 years before the injection; it did not show the synovial cyst.

4. Sagittal MRI provided suggests she might have been a candidate for surgery before. Was she already on a waiting list?

The patient was not on a surgical waiting list as she was not keen on surgical treatment and has been managed by physical medicine, rehabilitation pain management physician.

5. You stated - that one of the goals of surgery was instrumented fusion. However, it is not clear if the patient eventually underwent fusion and what kind of fusion (mini-open?, posterolateral?, interbody?). If not, why not if that was the goal?

Page 2, lines 26 and page 5 line 2-3: Patient had L3-S1 instrumentation and posterolateral fusion for the degenerative lumbar spine disease and spondylolisthesis.

6. Additional postsurgical images should accompany the manuscript (ap/lat X-rays (if fusion with screws); MRI showing resolution of spinal stenosis after removal of the cyst).

Postoperative plain radiographs provided.

Postoperative MRI was not done as the patient's radicular pain and weakness improved.

Reviewer # 5

Thank you for your comments.

The patient presented with severe lumbar degenerative diseases, including lumbar stenosis and L4 spondylolisthesis on L5. How to identify the patient's symptoms being caused by synovial cyst or by degenerative diseases?

Page 5, lines 18-21: The timing of the presenting symptoms and the progressive weakness after the epidural injection, in addition to the radiographic findings, support

the thought that introduction of a needle into a pre-existing synovial cyst had led to subsequent intra-cystic hemorrhage, rather than the chronic degenerative lumbar spine disease.

Why did authors use the L5 / S1 transforaminal epidural steroid injection, rather than through the sacral hiatus epidural injections?

Page 4, lines 2-3: The authors did not perform the injection. The patient was referred to the authors' clinic from a pain management physician who performed the injection after she started to develop radicular pain and progressive weakness.

Please provide the postoperative imaging data and histologic picture.

Postoperative plain radiographs provided.

The authors apologize for not being able to provide a histological picture, we requested them from the pathology department, however, they did not provide them in the time allotted to submit the revision of the manuscript.