

## REPLY TO REVIEWERS

**Re: Ms. No. World Journal of Clinical Cases-40557 – “Injury to the axillary artery and brachial plexus due to a closed floating shoulder injury: a case report and review of the literature”**

Dear Editor,

The authors would like to thank you and the Reviewer for all of your time and effort devoted to the review of our aforementioned manuscript. The Reviewer’s comments were indeed extremely insightful and greatly appreciated. As such, the authors would like to take this opportunity to address each and every concern the Reviewer noted in their review of our submission. In addition, where appropriate, we have also revised our manuscript accordingly. Any major changes in the paper are in yellow highlight.

We believe that the Reviewer’s comments have helped improve the quality of our manuscript. We hope that you and the Reviewer will find our revised work suitable for publication in *World Journal of Clinical Cases*.

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### **Reviewer #1**

**Comment #1:** Please change avascular necrosis at line 98 to irreversible ischaemia.

**Response:** We thank the reviewer for the very detailed comments. This has been changed and highlighted in the updated version of the manuscript accordingly.

**Comment #2:** Please confirm the surgical approaches used for fixation and how these were affected by the initial vascular reconstruction.

**Response:** We thank the reviewer for the very valuable comments. **Firstly**, After the anesthesia is successful, take the supine head high position. **Secondly**, Take the arc incision on the surface of the axillary artery in front of the left shoulder, cut the skin, subcutaneous tissue, pectoralis major, and pectoralis minor muscle layer by layer, reveal the left brachial plexus contusion and left axillary artery complete rupture, and end-to-end anastomoses were performed. **Thirdly**, Take the left shoulder subclavian transverse incision, cut the skin, subcutaneous tissue, platysma muscle layer by layer, reveal the oblique fracture of the clavicle, and the internal fixation were performed.

**Comment #3:** More detail is required in relation to neurological findings and the how these changed with time.

**Response:** We thank the reviewer for the very all-round comments. We apologize for the poor information with regard to the neurological findings and the how these changed with time.

Regarding the injury to the brachial plexus, emergency surgical exploration revealed that the brachial plexus had suffered contusions, preoperative and postoperative neurological examination revealed paresthesia resulting from brachial plexus contusion. Before the operation, the patient did not undergo electromyography and magnetic resonance examination due to emergency surgery. The patient did not accept to undergo electromyography and magnetic resonance examination after initial vascular reconstruction. And the patient left our city after discharge before the wound is healed. We can only follow up by telephone. During the follow-up period, the patient refused to undergo electromyography and magnetic resonance examination in her city. Three months after injury, the fingers of the left hand can move freely; the movement of the left shoulder, elbow, and wrist become more and more flexible and free; the numbness of the left upper limb is reduced; the strength of the left upper limb is significantly better than before, and she becomes able to take care of her daily life. At the 4th month of follow-up, the patient felt that the movement, numbness and strength of the left upper limb were better than before. After the fourth month of follow-up, the patient could not be contacted by telephone and the follow-up was completed. But we have been trying to contact this patient. Overall, the patient showed satisfactory recovery that was observed during 4-months follow-up. These statements have been added and highlighted in the updated version of the manuscript accordingly.

**Comment #4:** In the discussion add in detail regarding why/when temporary or definitive fixation is required before or after the vascular repair.

**Response:** We thank the reviewer for providing us very valuable suggestions. In the case of short ischemic time or only mild ischemia of the limb, a quick reduction and definitive fixation of the fracture may be beneficial. If the ischemia is severe or prolonged, vascular repair is preferred over orthopedic surgery and must be performed immediately. It is recommended that a stable surgical field through prior synthesis of the focus of the fracture be obtained to prevent new injuries and facilitate vascular repair. However, in patients with hemodynamic instability or in patients with ischemia for more than 8 hours, quick reduction and temporary fixation, and prior revascularization and subsequent osteosynthesis definitive fixation for fractures is instead recommended. These statements and the references have been added and highlighted in the updated version of the manuscript accordingly.

## **Reviewer #2**

**Comment #1:** Case characteristics does not describe patient: i.e. yrs, sex, type of trauma. Clinical diagnosis: it is Fracture of proximal humerus, Fracture of clavicle;etc... Differential diagnosis: may be arterial thrombosis, compression et.

**Response:** We thank the reviewer for pointing out the obvious missing information. These have been added and highlighted in the updated version of the manuscript accordingly.

**Case characteristics:** A 34-year-old female, 80-kg, presented to the hospital with 2 hours of persistent pain and swelling of her left shoulder, numbness of her left upper after trauma of losing control of her motorcycle on a highway and falling from the vehicle. **Clinical diagnosis:** Fracture of left proximal humerus, fracture of left clavicle, fracture of left scapula, left axillary artery rupture, and left brachial plexus injury. **Differential diagnosis:** Arterial thrombosis and

**compression.** **Laboratory diagnosis:** Complete blood count, electrolytes, and coagulation panels, were also normal, with hemoglobin and hematocrit results of 13.0 g/dL and 38.4%, respectively. **Imaging diagnosis:** X-ray and computed tomography (CT) images displayed multiple fractures of the shoulder that were indicative of a floating shoulder injury. In addition, CT angiography and duplex ultrasonography revealed interruption of blood flow through the axillary artery, with distal flow being maintained through collateral arteries.

**Comment #2:** Needs minor language corrections Manuscript is otherwise acceptable

**Response:** We thank the reviewer for very positive comment. We try our best and we have submitted our manuscript to the language company (Editage : [www.editage.cn](http://www.editage.cn)) for English language editing .

#### **40557-CrossCheck Report:**

**We checked the paper by crosscheck, there are similar sentences (highlighted in the report) with other articles, please see details on the crosscheck report and rewrote these sentences.**

***Response:*** We thank the reviewer for very valuable suggestions. These have been changed and highlighted in the updated version of the manuscript accordingly.

1. “revealed multiple fractures of the scapular region that were suggestive of a floating shoulder injury.” has been rewritten as “revealed multiple fractures of the scapular area, implying that it is a floating shoulder injury.”
2. “Since Ganz and Noesberger’s first description of the pathologic anatomy of the floating shoulder, its defining features have been modified and updated by several authors.” has been rewritten as “Since Ganz and Noesberger’s first statement of the pathologic anatomy of the floating shoulder, its defining characteristics have been revised by other authors.”
3. “Goss and co-workers introduced the concept of the superior shoulder suspensory complex (SSSC), and expanded the definition of a floating shoulder to encompass a double disruption of the bone and soft tissue ring comprising the SSSC.” has been rewritten as “Goss and co-workers stated the definition of the superior shoulder suspensory complex (SSSC), and extended the description of a floating shoulder comprising the SSSC.”
4. “however, there is still considerable ambiguity as to the precise definition of a floating shoulder, presumably because it is relatively uncommon injury complex.” has been rewritten as “the unified definition of a floating shoulder is still considerable ambiguity, probably because it is a rare injury complex.”
5. “Despite the anatomic proximity of the axillary artery to the clavicle, scapula, and proximal humerus, its injury does not occur as often as might be expected. There are few reported cases of axillary artery injury following closed trauma in the literature;” has been rewritten as “Despite the anatomic proximity of the axillary artery to the clavicle, scapula, and proximal humerus, its injury is rare.”

6. “The first section is defined as the portion between the first rib and the pectoralis minor muscle, the second section lies beneath the pectoralis minor muscle, and the third section comprises the portion running from the lower edge of the pectoralis minor muscle to the teres major muscle.” has been rewritten as “The axillary artery is a continuation of the subclavian artery and is divided into three sections based on its location relative to the pectoralis minor muscle. The first section is defined as the part of the artery superior to the pectoralis minor muscle, the second section lies posterior to the pectoralis minor muscle, and the third section comprises the part of the artery inferior to the pectoralis minor.”

7. “It has been speculated that this is because the pectoralis minor muscle acts as a fulcrum against which the humeral head bends the axillary artery.” has been rewritten as “It has been speculated that this is because the axillary artery is fixed and bent by other branch arteries and the humeral head.”

8. “axillary artery because collateral flow is abundant around the shoulder joint.<sup>[14]</sup> Extensive anastomoses among the transverse cervical artery, the suprascapular artery, and the subscapular artery ensure adequate blood flow to distal portions of the limb. Therefore, axillary artery injury sites that are proximal to the origin of the subscapular artery may not compromise blood supply to the upper extremity.” has been rewritten as “well-developed collateral vessels around the shoulder joint.<sup>[14]</sup> Extensive connections among the suprascapular artery, the subscapular artery and other arteries supply adequate amounts of blood to distal limb. Therefore, axillary artery injury sites that are near to the origin of the subscapular artery may not impair blood supply to the upper limb.”

9. “Due to the proximity of these two structures, the area is predisposed to hemorrhagic lesions, compression of the brachial plexus, and subsequent ischemia of nerve trunks due to the formation of a hematoma or inflammation of peripheral tissue.<sup>[13]</sup>” has been rewritten as “Due to the proximity of the axillary artery and the brachial plexus, the area is predisposed to hemorrhagic lesions, brachial plexus compression, and subsequent ischemia.<sup>[13]</sup>”

10. “Emergency surgery is recommended in cases of vascular compromise, open fracture, avulsion of the subscapularis attachment on the lesser tubercle, joint surface involvement, or if

the fracture threatens the integrity of the overlying skin.<sup>[16]</sup> When the lesion is clinically evident or visible by angiogram, the gold standard for treatment consists of open reduction and internal fixation of the fracture and vascular repair.<sup>[13]</sup>” has been rewritten as “Emergency surgery is recommended in cases of vascular compromise.<sup>[16]</sup> The gold standard for treatment includes open reduction and internal fixation of fractures and vascular reconstruction when the lesion is clinically significant or visible by angiography.<sup>[13]</sup>”

11. “It is recommended that a stable surgical field through prior synthesis of the focus of the fracture be obtained to prevent new injuries and facilitate vascular repair. However, in cases of hemodynamically unstable patients or those where there has been more than 8 hours of ischemia, prior revascularization and subsequent osteosynthesis for fractures is instead recommended.<sup>[13]</sup>” has been rewritten as “In the case of short ischemic time or only mild ischemia of the limb, a quick reduction and definitive fixation of the fracture may be beneficial. If the ischemia is severe or prolonged, vascular repair is preferred over orthopedic surgery and must be performed immediately. It is recommended that a stable surgical field through prior internal fixation of the fracture be obtained to avoid new injuries and facilitate vascular reconstruction. However, in patients with hemodynamic instability or in patients with ischemia for more than 8 hours, quick reduction and temporary fixation, and prior revascularization and subsequent osteosynthesis definitive fixation for fractures is instead recommended.<sup>[13, 17]</sup>”

12. “dislocation, injury to the axillary artery should be suspected. However, diagnosis of axillary artery injury is difficult in some cases.” has been rewritten as “fractures or shoulder dislocation, the axillary artery injury should be suspected. However, axillary artery injury is difficult to diagnose in some cases.”

13. “CT angiography or angiography using a catheter is useful for detecting the area of injury, and angiography using a catheter can facilitate arterial repair by enabling the placement of a stent graft at the same time.” has been rewritten as “Catheter-based CT angiography can be used to detect damaged areas, and it can facilitate arterial repair by placing stent grafts at the same time.”

14. “Vascular state should be evaluated periodically after a fracture because pulses may disappear and symptoms may appear after several days.” has been rewritten as “The state of the blood vessels should be assessed periodically after the fracture, as the pulse may disappear and ischemic symptoms may appear after a few days.”

15. “As such, they require prompt recognition and the involvement of a multidisciplinary team of orthopedic, trauma, and vascular surgeons to coordinate injury management.” has been rewritten as “Therefore, they need to be identified and coordinated by a multidisciplinary team of orthopaedics, trauma and vascular surgeons.”

**When you send back, please provide the format of doc, not the pdf. Thank you!**

**Response:** We thank the reviewer for very valuable suggestions. We provide the format of doc.

Thank you!

**Only one correspondent author is required. Please keep one.**

**Response:** We thank the reviewer for the very all-round comments. These have been changed and highlighted in the updated version of the manuscript accordingly.

Yuchun Chen<sup>1\*</sup>, Zhen Lian<sup>1\*</sup>, Yanna Lin<sup>2</sup>, Xinjia Wang<sup>1</sup>, Guanfeng Yao<sup>1#</sup>

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**Sorry to inform you that the informed consent you provided does not meet our requirements. Please provide the original Chinese version of the consent form signed by the**



**patient or family member or other consent form signed before the treatment and affix the official seal of the unit, and the informed consent form should be your unit. Please scan to PDF version.**

***Response:*** We thank the reviewer for the very all-round comments. These have been provided accordingly.

**Non-structural summary, please modify. The number of words required does not exceed 150.**

***Response:*** We thank the reviewer for the very all-round comments. These have been changed accordingly.

A floating shoulder may be associated with catastrophic neurovascular injury and requires a multidisciplinary approach for its management. To maximize the likelihood of good patient outcomes, this unique injury pattern should be recognized in patients as early as possible. This can be difficult to achieve, however, as there are currently few reports of floating shoulder in the literature, meaning associated neurovascular injuries may be overlooked. We present here a rare case of floating shoulder with axillary artery injury and brachial plexus injuries. We successfully performed open reduction and internal fixation of the fracture and vascular repair. This case report shows that catastrophic axillary artery injury can occur with floating shoulder injuries by the distal fragment of the clavicle. The gold diagnosis of axillary artery injury is mainly based on the combination of angiogram and CT angiography. Emergency surgery can be an effective therapeutic management as soon as possible.

**Core tip. Please write a summary of no more than 100 words to present the core content of your manuscript, highlighting the most innovative and important findings and/or**

arguments. The purpose of the Core Tip is to attract readers' interest for reading the full version of your article and increasing the impact of your article in your field of study.

**Response:** We thank the reviewer for the very all-round comments. These have been added and highlighted in the updated version of the manuscript accordingly.

**Core tip:** A floating shoulder with catastrophic neurovascular injury may be overlooked, as there are currently few reports in the literature. This case report describes that brachial plexus and axillary artery injury by the distal fragment of the clavicle in a closed floating shoulder, and we successfully performed open reduction and internal fixation of the fracture and vascular repair.

**Audio Core Tip** Please offer the audio core tip, the requirement are as follows: In order to attract readers to read your full-text article, we request that the first author make an audio file describing your final core tip. This audio file will be published online, along with your article. Please submit audio files according to the following specifications: Acceptable file formats: .mp3, .wav, or .aiff

**Response:** We thank the reviewer for the very all-round comments. These have been provided accordingly.

Figure file names should identify the figure and panel. Avoid layering type directly over shaded or textured areas in the figure. Uniform presentation should be used for figures showing the same or similar contents; for example, "Figure 1 Pathological changes of atrophic gastritis after treatment. A: ...; B: ...; C: ...; D: ...; E: ...; F: ...; G: ...".

**Response:** We thank the reviewer for the very all-round comments. These have been changed and highlighted in the updated version of the manuscript accordingly.

## **Legends**

**Figure 1 Closed left “floating shoulder.” Marked soft tissue swelling, subcutaneous congestion and deformity of the left shoulder.**

**Figure 2 The Doppler ultrasound revealed interruption of blood flow through the axillary artery. A :** The distal axillary artery was not unclear; **B:** The perivascular blood accumulation was obvious.

**Figure 3 Plain anterior-posterior radiographs and CT images of left shoulder. A:** X-ray demonstrating fractures of the left scapula, left proximal humerus, left clavicle and left shoulder soft tissue swelling; **B:** 3D CT angiography reconstruction of left shoulder also demonstrating multiple fractures of the scapular region, and interruption of blood flow through the axillary artery.

**Figure 4 The axillary artery injury and repair. A:** Emergency surgical revealed that the axillary artery was completely amputated; **B:** End-to-end anastomoses were thus performed after excision of traumatized vessel segments.

**Figure 5 Evidence of axillary artery successfully repaired. A:** CT angiography confirmed that blood flow of left axillary artery was restored after vascular repair; **B:** CT angiography without bone confirmed that blood flow of left axillary artery was restored after vascular repair.

**Figure 6 Postoperative radiograph showing reduction and locking plate. A:** Positive slice; **B:** Oblique slice.