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Please cite this article as https://doi.org/10.4097/kja.22413
Letter to the Editor

Suprascapular notch cross-sectional area by MRI do not yield accuracy in the diagnosis of suprascapular nerve entrapment – counter point of view

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Short running title: Suprascapular notch cross-sectional area

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Conflict of Interest
No conflict of interest relevant to this article.

IRB No.: EK-353/19

Clinical trial registration No.: not applicable.
Funding
Grant Agency of Charles University: GAUK No. 1720119

Ethical approval
The study and access to specimens was approved for research and education purposes by the Institutional Review Board (IRB) – The Ethics Committee of the University Hospital Motol and Second Faculty of Medicine, Charles University, in Prague, Czech Republic [Reference ID no. EK-353/19].

Conflict of Interest
No conflict of interest relevant to this article.

CRediT authorship contribution statement
Azzat Al-Redouan: Conceptualization, Investigation, Visualization, Writing - Original Draft.
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- Letter to the Editor -

We read with interest the recently published original article by Park et al. [1] presenting the suprascapular notch (SSN) cross-sectional area as a candidate MRI diagnostic indicator in suprascapular nerve (SN) entrapment with claimed high accuracy. We appreciate the authors' attempt to explore additional parameters utilizing the MRI imaging method. Nonetheless, the study contained vital anatomical errors that need to be addressed and clarified. Also, the claim that the SSN space analysis and correlation of its types to SN entrapment being novel and has not been reported before is not true. We kindly would like to direct the authors’ attention to review the previously published original article by Al-Redouan et al. [2] and the cited articles in the study. In addition, the concluded accuracy of the method or better said the efficacy of the approach was not driven from a supporting power study and rather qualitative descriptive study from 10 samples. Park et al. [1] omitted comparing the MRI imaging method with the other explored modalities. We also kindly like to refer the authors to review the published article by Jezierski et al. [3] as it elaborated on ultrasound as an imaging modality revealing the SSN morphological types influence on its visualization.

The anatomical error in the study by Park et al. [1] comprises the localization and bordering of the SSN in their presented MRI figure demonstrating the cross-sectional area parameter of the SSN. This specific represented section is in fact more dorsally to the SSN and it is within the passage of the suprascapular canal (SSC) residing within the spinoglenoid fossa (SGF) [4]. We present in Fig. 1 a serial frontal section of the shoulder clarifying the SSC MRI anatomy. The SSN localization is
met by identifying its bordering anatomical landmarks. The base of the coracoid process borders the suprascapular notch laterally and can be navigated on cross-sections with ease (Fig. 1A). The authors mentioned that MRI frontal sections cut through the SSN in rather oblique planes, which we do agree with. Therefore, the medial border forming the second anatomical landmark, which is the medial peak of the SSN where the omohyoid muscle attaches, has poor MRI visualization and is not usually seen precisely. The delineated space in the figure by Park et al. [1] is a midway site within the passage interval of the SSC [4] corresponding to Fig. 1D in our MRI illustration. It is an anatomically visible groove containing the traveling suprascapular neurovascular bundle residing within the SGF and roofed by the supraspinatus muscle. The SGF is identified by its laterally bordering glenoid and medially bordering spinoacromial arch, proximal to the spinoglenoid notch (SGN). The spinoacromial arch may not be visible on the same plane of MRI due to the obliquity of its trajectory. However, because the SGF connects between the SSN and the SGN [4], this can be confirmed by navigating the proceeding sections where the SGN is detected by seeing the base of the spine of scapula between the supraspinatus and infraspinatus muscles (Fig. 1E). In fact, this is a common imaging trap as described by Podgórski at al. [5]. In their ultrasound study, they had mentioned capturing a section behind the SSN will yield a pseudo-notch image on ultrasound [5]. This imaging technicality concept stands the same in MRI and CT images of the SSC.

Park et al. [1] claimed novelty in their study beside two statements asserting that the SSN area was not analyzed nor a morphological correlation between the SSN typing and the SN entrapment being reported. However, a previous study by Al-Redouan et al. [2] demonstrated five morphological SSN stenosis patterns by utilizing previously established SSN typing systems and included five parameters statistically driven correlation analysis in dry bones [2]. In order to measure a cross-sectional area digitally with accuracy, an observer must be able to delineate the margins of all bordering parameters. This is a major MRI limitation and should be compared to
other modalities such as ultrasound which allows plane manipulation. The height or the width of the SSN can potentially yield higher accuracy on MRI measurements than the cross-sectional area due to a much higher chance of having a single parameter coming fully into the full visualization plane. This is not the same in case of attempting to capture three collective parameters aligned in differing space orientation. Those parameters that govern the cross-sectional area were analyzed previously and the height versus upper and mid width were demonstrated to be candidate indicators of the SSN stenosis in correlation to SN entrapment [2–4].

In conclusion, the proposed SSN cross-sectional area by Park et al. [1] does not seem to be an accurate approach to estimate the SSN stenosis and hence its reliability as an indicator to assess the SN entrapments is questionable. Examining the height of the SSN and the width of the SSN individually would yield higher detection of SSN stenosis [2]. MRI is a useful modality to screen the SSC surrounding tissue for pathologies [4]. Ultrasound has higher potential to navigate the SSC intervals due to probe orientation feasibility in which an observer can manipulate the projecting planes [3].
References


Fig 1. Retrospective MRI frontal section series illustrating the suprascapular notch and suprascapular canal anatomy. SSN: suprascapular notch, Snv: suprascapular neurovascular bundle traveling within the suprascapular canal, SGF: spinoglenoid fossa housing the suprascapular canal, SGN: spinoglenoid notch, CorP: coracoid process (the base of coracoid process), Gln: glenoid, Spn: spine of scapula, SprS: supraspinatus muscle, InrS: infraspinatus muscle, SubS: subscapularis muscle.