

Reviewer #1:

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Minor revision

Specific Comments to Authors: Dear authors, thank you for putting so much effort in the preparation of the manuscript. It is a very interesting topic and I have few suggestions to improve the manuscript.

Introduction: The locations in which stress fractures develop depend primarily on the type of physical activity performed by the individual, parts of the body involved in the activity and the stresses exerted on a particular anatomic structure. Please include a reference.

Thank you for noticing lack of reference. We corrected this mistake by adding three references:

Astur DC, Zanatta F, Arliani GG, Moraes ER, De Castro Pochini A, Ejnisman B. Stress fractures: definition, diagnosis and treatment. *Rev Bras Ortop* 2016. **51**: 3-10 [PMID: 26962487 DOI: 10.1016/j.rboe.2015.12.008]

Romani WA, Gieck JH, Perrin DH, Saliba EN, Kahler DM. Mechanisms and Management of Stress Fractures in Physically Active Persons. *J Athl Train* 2002. **37**: 306-314 [PMID: 16558676]

Wasserstein D, Spindler KP. Pathophysiology and Epidemiology of Stress Fractures. In: Miller TL, Kaeding CC (eds) *Stress Fractures in Athletes. Diagnosis and management*. 2015. London. Pp. 3-13 [DOI: 10.1007/978-3-319-09238-6]

Do you present the average age or median age in case presentation?

In the first sentence of paragraph "Case presentation" we present the average age, and in brackets the age range of patients.

RESULTS: Can you create a table to give an overview of the different cases?

We created a Table 1 and presented it in "Case presentation".

Why did your follow up vary among different patients?

Follow-up time varies due to the fact that the medical data about cases was reviewed and collected retrospectively. The follow-up also differed since patients got better and fracture healed in various time after diagnosis was made. Table 1 summarizes follow-up timeline.

When did you use an MRI scan when a CT scan?

Thank you for this question. In the Introduction section we stated based on the literature that "a diagnostic method is selected according to the location and stage of development with regard to healing". Only in one case (Case 4 - Tibia) the CT was performed first due to evident cause of pain being in the bone tissue. In Case 6 - Femoral neck, the CT imaging was done after X-ray examination but before MRI, because femoral head necrosis or a stress fracture was suspected. In case of femoral neck and subtrochanteric region, cortical layer damage may be suspected, thus CT was performed in the first place. In this patient the MRI was performed at once after CT in order to find the cause of pain. In the majority of cases the MRI was done primarily which is consistent with diagnostic process both in overuse syndrome or stress fracture.

We added an additional paragraph about imaging methods used in diagnostic process of stress fractures.

DISCUSSION: I would suggest to focus on the literature. It seems that you summarize your own findings, diagnostic protocols and you recommend your personal opinion.

Thank you for this valuable suggestion. We reorganized the Discussion section: 1) we deleted the first paragraph which summarized our findings, 2) added literature findings about application of platelet-rich plasma and low-intensity pulsed ultrasound (LIPUS) in stress fractures, 3) developed an algorithm, 4) added comparison of available imaging techniques used in diagnostic of fatigue fractures, 5) added information about contraception and its influence.

Please state which is more sensitive/ Specific to detect stress fractures: MRI or CT scan. Which one is superior?

The additional paragraph about comparison of available techniques was added.

What does the literature report about ultrasound healing device and PRP?

Thank you for this question. We added additional information about application of low-intensity pulsed ultrasound (LIPUS) and platelet-rich plasma in patients with stress fractures.

'cooperation is key to making accurate and quick diagnoses. Radiologists who know a patient's medical history can assess' Please change either TO MAKE or delete TO

We corrected this sentence.

It seems that you prescribe Vit D routinely without testing the Vit D levels? What is the evidence for it? do you have any references for it?

Thank you for this comment. We do not prescribe Vit. D routinely without testing its level but we see parts which could have misled you:

- In Case 6 we stated that: „The laboratory tests revealed a low concentration of 25-hydroxyvitamin D3 (43.00 ng/ml; normal range 30-100 ng/ml), so the patient was instructed to continue supplementation with vitamin D.” Based on medical interview it was highly suspected that the patient has decreased level of vitamin D (lack of sunlight due to office work, poor diet). Therefore, a vitamin D blood test was recommended and standard-dose vitamin D supplementation (according Rusińska A et al. 2018*) was prescribed until patient took the test. After a few days patient sent us results of vitamin D test, so that is why we use “continue” in the description. We corrected this misleading description.

- In Case 5: in “History of past illness” we included information that patient had stress fractures that occurred 3 years earlier and they healed after supplementation with vitamin D, of course based on previous results which showed decreased level of vitamin D. In the present treatment we recommended first to control her vitamin D level which is stated in *Treatment* section.

- The other cases should not be misleading: In Cases 1, 3, 4 the laboratory examination was not performed and supplementation was not prescribed. In Case 2 first laboratory test was recommended.

* **Rusińska A**, Płudowski P, et al. Vitamin D Supplementation Guidelines for General Population and Groups at Risk of Vitamin D Deficiency in Poland – Recommendations of the Polish Society of Pediatric Endocrinology and Diabetes and the Expert Panel with Participation of National Specialist Consultants and Representatives of Scientific Societies – 2018 Update. *Frontiers in Endocrinology* 2018. **9**: 1-21 [PMID: 29904370 DOI: 10.3389/fendo.2018.00246]

Have you asked for the intake of anticonceptions? Does this influence stress fractures?

Thank you for this question. We did not ask females about contraception due to the fact that the influence of the oral contraceptive pill (OCP) on stress fracture risk is unknown. Based on the review of literature, there have been no randomized studies which show that use of the OCP reduces the stress fracture rate in athletes, especially in those with menstrual disturbances.

The part about effects of the oral contraceptive pill on stress fracture risk was included in the manuscript.

You suggest laboratory diagnostics -> what do you expect?

We suggest laboratory diagnostics in order to verify possible vitamin D deficiency. The main aim of testing vitamin D level is to support bone remodeling (Ogan D, Pritchett K. Vitamin D and the athlete: risks, recommendations, and benefits. *Nutrients*. 2013;5:1856-1868) and prevent future fractures as it was stated by Lappe et al. that supplementation of calcium and vitamin D reduces the incidence of stress fractures by as much as 20% (Lappe J, Cullen D, Haynatzki G, Recker R, Ahlf R, Thompson K. Calcium and vitamin D supplementation decreases incidence of stress fractures in female navy recruits. *J Bone Miner Res*. 2008; 23:741-749). We added such information to the manuscript.

'Considering the influence of vitamin D levels on fatigue fractures, it should be noted that at least half of the patients diagnosed with this type of malady are characterized as having a low level of this vitamin (levels below 40 ng/mL are considered insufficient based on the standards established by the Vitamin D Council; levels below 30 ng/mL are considered insufficient based on the recommendations by the US Endocrine Society). ' Please include a reference

We added 2 references in the text (changes in green):

Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, Murad MH, Weaver CM, Endocrine S. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2011. **96**: 1911-30 [PMID: 21646368 DOI: 10.1210/jc.2011-0385]

Feldman D (ed.) Vitamin D 4th Edition. Volume 1: Biochemistry, Physiology and Diagnostics. 2017

'High-risk patients, such as female running athletes, are particularly noteworthy.' Any reference?

We added 3 references in the text:

- 1 **Duckham R**, Peirce N, Meyer C, et al. Risk factors for stress fracture in female endurance athletes: a cross-sectional study. *BMJ Open* 2012. **2**: e001920 [PMID: 23166136 DOI: 10.1136/bmjopen-2012- 001920]
- 2 **Chen Y-T**, Tenforde AS, Fredericson M. Update on stress fractures in female athletes: epidemiology, treatment and prevention. *Curr Rev Musculoskelet Med* 2013. **6**: 173-181 [PMID: 23536179 DOI: 10.1007/s12178-013-9167-x]
- 3 **Joy E**, Campbell D. Stress fractures in the female athlete. *Curr Sport Med Rep* 2005. **4**: 323-8 [PMID: 16282034 DOI: 10.1097/01.csmr.0000306294.72578.a8]

'Currently, the utilization of advanced multisensory recording systems, which allow motion data to be recorded (called motion capture systems), and even wireless surface electromyography (<http://www.motekmedical.com>) or textile-based electromyography have been introduced for the clinical analysis, rehabilitation, evaluation and recording of the human balance system.' Please include a reference.

We included 4 references:

McGinley JL, Baker R, Wolfe R, Morris ME. The reliability of three-dimensional kinematic gait measurements: a systematic review. *Gait Posture* 2009. **29**: 360-369 [PMID: 19013070 DOI: 10.1016/j.gaitpost.2008.09.003]

Milner CE, Ferber R, Pollard CD, Hamill J, Davis IS. Biomechanical factors associated with tibial stress fracture in female runners. *Med Sci Sports Exerc* 2006. **38**: 323-328 [PMID: 16531902 DOI: 10.1249/01.mss.0000183477.75808.92]

Sakata T, Kimura Y, Hida T. First rib stress fracture in a sidearm baseball pitcher: a case report. *J Sports Sci Med* 2005. **4**: 201-207 [PMID: 24431977]

Postolache G, Carvalho H, Catarino A, Postolache OA. Smart clothes for rehabilitation context: technical and technological issues. In: Postolache O, Mukhopadhyay S, Jayasundera K, Swain A (eds) *Sensors for everyday life: Healthcare Settings*. 2017. Lisbon. Pp 185-198 [DOI: 10.1007/978-3-319-47319-2]

Finally I would suggest to develop an algorithm.

Thank you for this suggestion. We added an algorithm (Figure 15).