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Article type : Letter to Editor

Niche definition and guidance for detailed niche evaluation

Sir,

With interest we read the correspondence of Bamberg et al.[1] and Scioscia et al.[2] about the randomized controlled trial of the first authors concerning the uterine niche after caesarean section (CS).[3] They state that at the time of the trial it was not established which technique should be used in the evaluation of a caesarean scar or niche in daily practice and future research. Both authors underline the need for a uniform evaluation of the CS scar establishing an internationally accepted definition of a niche. In their study a niche was defined as an anechogenic area at the site of the uterine scar with a depth of at least 1 mm. We agree with their statement that at the time of the design of their study a uniform definition was lacking. However we do not agree with their last statement about the need for an international definition of a niche and how to measure this. Previously, Naji et al.[4] proposed a standardized approach for niche description using ultrasound in non-pregnant women. Given the fact that this approach did not take into account the possible variations concerning the morphology of niches we developed an updated guideline on the ultrasonographic evaluation of a niche. To establish this guideline, first a modified Delphi study was executed among 15 European niche experts.[5] These experts were selected based on their experience (number of niche evaluations per year, published articles or conference presentations concerning ultrasound and niches). Consensus was reached for all niche items concerning definitions, methods and relevance after two digital questionnaire rounds and one group meeting.

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/aogs.13623

In our Delphi study it was agreed that a niche should be defined as an indentation at the site of the CS scar with a depth of at least 2 mm. Furthermore, a niche can be subclassified as 1. simple niche; 2. simple niche with one branch; or 3. complex niche (with more than one branch). A branch is a thinner part of the main niche, directed towards the serosa and with a smaller width than that of the main niche. Niche measurements that should be performed in basic evaluation (niche length, depth, residual myometrium thickness (RMT), adjacent myometrium thickness (AMT) and width) were described and illustrated. Most experts agreed that gel infusion sonography (GIS) or saline contrast sonohysterography (SCSH) is preferred over standard TVS, but is not mandatory if intrauterine fluid is present. This was supported by an overview of studies comparing TVS vs GIS or SCSH, which is presented in the appendix. The relevance of hysteroscopy was not included to the study.

We hope that our published and well recognized method of niche evaluation will be adopted by other international niche experts.

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References

1. Bamberg C, Hinkson L, Henrich W. Cesarean scar niche and uterotomy closure technique. Acta Obstet Gynecol Scand. 2018;97(5):630.

2. Scioscia M, Iannone P, Morano D, Pontrelli G, Greco P. Comment on "Longitudinal transvaginal ultrasound evaluation of cesarean scar niche incidence and depth in the first two years after single- or double-layer uterotomy closure: a randomized controlled trial". Acta Obstet Gynecol Scand. 2018;97(5):629.

3. Bamberg C, Hinkson L, Dudenhausen JW, Bujak V, Kalache KD, Henrich W. Longitudinal transvaginal ultrasound evaluation of cesarean scar niche incidence and depth in the first two years after single- or double-layer uterotomy closure: a randomized controlled trial. Acta Obstet Gynecol Scand. 2017;96(12):1484-9.

4. Naji O, Abdallah Y, Bij De Vaate AJ et al. Standardized approach for imaging and measuring Cesarean section scars using ultrasonography. Ultrasound Obstet Gynecol. 2012;39(3):252-9.

5. Jordans IPM, de Leeuw RA, Stegwee SI, et al. Sonographic examination of uterine niche in non-pregnant women: a modified Delphi procedure. Ultrasound Obstet Gynecol. 2019;53(1):107-15.