Ultrasound accurately assesses depth of invasion in T1-T2 oral tongue cancer

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Background

To determine depth of invasion (DOI) in oral tongue cancer, clinical palpation is performed, but the preferred radiological modality remains controversial. The aim of this study was to investigate the assessment of DOI using ultrasound (US-DOI).

Methods

The DOI was assessed in 40 patients with T1–T3 tongue cancer by ultrasound, palpation and magnetic resonance imaging (MRI). Histopathological DOI (H-DOI) was gold standard. Bland-Altman analysis was used to compare mean difference and 95% limits of agreement (LOA).

Results

The mean difference of US-DOI was -0.5mm (95% LOA -4.9 to 4.0) compared to H-DOI and for MRI it was 3.9mm (95% LOA -2.3 to 10.2). In the subgroup analysis of cT1-T2 the US-DOI mean difference was 0.1mm (95% LOA -2.5 to 2.7). MRI-DOI could not be assessed in eight of the 38 examinations (21.0%), while US could measure DOI in all cases.

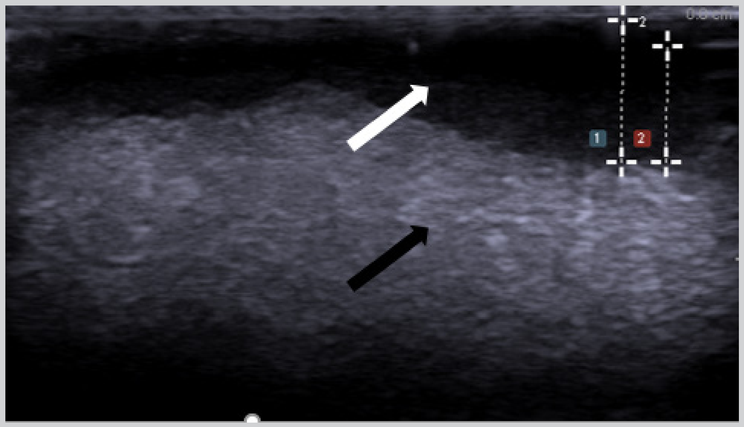

Figure 1. US measurement of DOI. The tumor is seen hypoechoic (white arrow) compared to the isoechogenic normal tongue muscle (black arrow). 1 = 5.5mm represents tumor thickness. 2 = 4.5mm represents DOI.

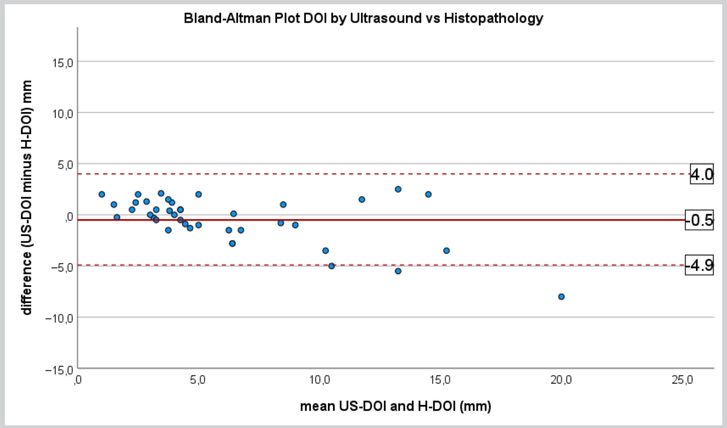

Figure 2. Bland–Altman analysis of US-DOI vs H-DOI. n=40. Solid line represents mean difference and dotted lines 95% limits of agreement (LOA).

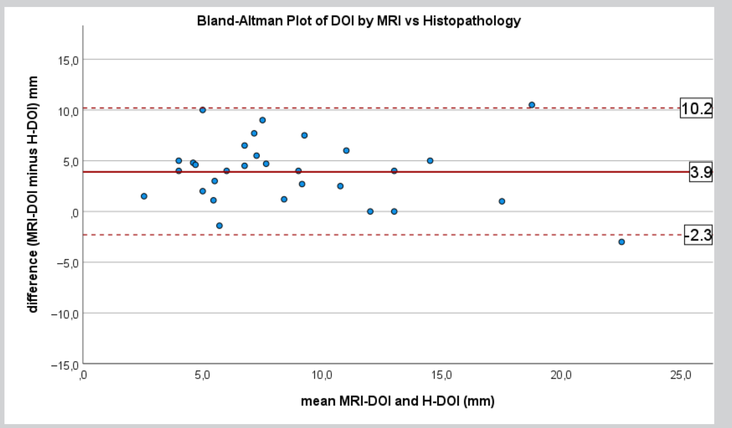

Figure 3. Bland–Altman analysis of MRI-DOI vs H-DOI. n=30. Solid line represents mean difference and dotted lines 95% limits of agreement (LOA).

Conclusions

Ultrasound seems to be the most accurate method to assess DOI in T1–T2 oral tongue cancer. MRI overestimates DOI and cannot assess a substantial proportion of the tumors.

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