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Case Report

Ultrasound and elastography imaging of carcinoma tongue with pathological correlation-a case report

Ayush Gupta*, Suresh V. Phatak, Nipun Gupta, Shishir Rawekar

Department of Radio-diagnosis, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, Maharashtra, India

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***Correspondence:**
Dr. Ayush Gupta,
E-mail: dewpyy@gmail.com

ABSTRACT

Here we are presenting a case of 45 years old female with history of ulcerative lesion on right lateral border of the tongue for 6 months with metastatic lesion in the liver. USG and Elastographic imaging findings are discussed.

Keywords: Tongue malignancy, Tsukuba Scoring System, Strain ratio, Ultrasound elastography

INTRODUCTION

Many diseases present themselves in oral and maxillofacial regions and various modalities may be applied for their diagnosis including sonography, CT and MRI. Of these modalities, USG is easy-to-use for the detection of diseases of tongue. Nearly all tumours of the oral tongue occur on the lateral and under surface. Dorsal tumours are uncommon but when they do occur, they are usually located near the midline and more posteriorly.[1] Elastography is a recent modality which is used currently in diagnosis of breast, thyroid and liver disorders. We are presenting USG and Elastographic imaging findings of Carcinoma tongue with classic images.

CASE REPORT

A 45-year-old female with history of tobacco chewing from last 20 years presented with the chief complaint of ulcer on the right lateral border of tongue, associated with mild discomfort when speaking and occasionally bleeding on touch. The ulcer had been present for the past 6 months, gradually growing in size. Sonographic examination revealed large hypoechoic mass of size 18 X 8 mm in the right lateral border of the tongue which was very vascular on doppler study. On strain elastography, it showed stiff tissue in the ulcer (Dark blue color), indicating score of 5 on Tsukuba elastography scoring system. On abdominal sonographic evaluation, a metastatic lesion was found in the medial segment of the left lobe measuring 31 X 24mm in size. The biopsy report from the ulcer suggested squamous cell carcinoma.

Figure 1: USG tongue showing large hypoechoic lesion of size 18 x 8 mm on right lateral boder of the tongue.

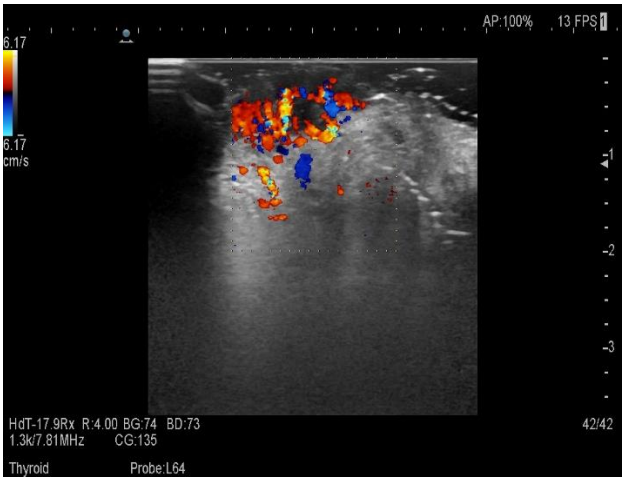

Figure 2: Color doppler showing highly vascular nature of the lesion.

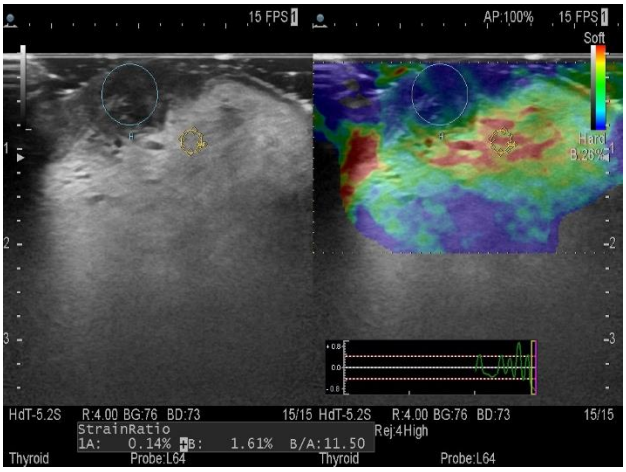

Figure 3: The hypoechoic lesion is showing dark blue color on elastography (score 5 on Tsukuba scoring system). strain ratio is 11.50, indicating malignant nature of the lesion.

Figure 4: USG liver depicts a metastatic lesion of size 31 x 24mm in medial segment of the left lobe.

DISCUSSION

Tongue malignancy is a common malignancy associated with risk factors like excessive alcohol consumption, heavy tobacco smoking and human papilloma virus. Patient's five-year survival is dependent on early diagnosis. It is, therefore, important to diagnose early and image accurately to ensure good outcomes.[2] The tongue is the centrepiece of the oral cavity and the oropharynx. It enables taste of food and plays a critical role in formation of food bolus and deglutition. The tongue is also crucial for speech. Speech is impaired by glossectomy, the degree of which depends on the extent of the resection.

In fact, the earliest sign of tongue paresis is a change in the quality of speech. Nearly all tumours of the oral tongue occur on the lateral and under surface. Dorsal tumours are uncommon but when they do occur, they are usually located near the midline and more posteriorly. Oral tongue tumours tend to remain in the tongue. Surgical resection remains the treatment of choice.[3] Tsukuba scoring system: Itoh et al in gave a elastographic scoring system for diagnosis of malignancy.

A score of 1 indicated even strain for the entire hypoechoic lesion (i.e., the entire lesion was evenly shaded in green). A score of 2 means strain in most of the hypoechoic lesion, with some areas of no strain (i.e., the hypoechoic lesion had a mosaic pattern of green and blue), A score of 3 implies that strain at the periphery of the hypoechoic lesion, with sparing of the center of the lesion (i.e., the peripheral part of lesion was green, and the central part was blue). A score of 4 shows no strain in the entire hypoechoic lesion (i.e., the entire lesion was blue, but its surrounding area was not included.

A score of 5 indicated no strain in the entire hypoechoic lesion or in the surrounding area (i.e., both the entire hypoechoic lesion and its surrounding area were blue). BGR represents typical artifactual three layered aspect (blue-green-red) encountered with cystic lesions. In strain patterns, score 1, 2 and 3 emphasized benign features whereas masses with scores of 4 and 5 were considered as malignant.[4]

Strain ratio measurement

A semi quantitative method of lesion assessment, termed as strain ratio (SR) measurement, has also been developed. Calculation of the SR value is based on determining the average strain measured in a lesion and comparing it to the average strain of a similar area of fatty tissue in the adjacent breast tissue. Using proprietary software, the average strain of the lesion is determined by selecting a region of interest (ROI) encompassing the lesion; the value of strain ratio increases as a function of the relative stiffness of the target lesion. As the Strain Ratio increases, the likelihood of cancer is also higher.[5]

CONCLUSION

The Ultrasound proves to be a very essential tool in evaluation of tongue and other intraoral malignancies. The use of ultrasound for such type of lesions is suggested as it is a readily available and cheap imaging modality as compared to MRI. The elastography using the Tsukuba Scoring system gives us very accurate information regarding the nature and properties of the lesion.

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