

# Peculiar Ultrasonography Feature of a Subcutaneous Abscess on Cheek - A Rare Case Report

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## ABSTRACT

The skin on the face is prone to a number of ailments due to the presence of hair follicles, glands, and pores. One such infection is a bacterial infection that affects the hair follicles. Folliculitis is a hair follicle infection caused by the inflammation of hair follicles as a result of physical injury, chemical irritation, or infection. It is possible that the hair within the follicle will become contaminated if it is trapped and unable to break through the epidermis, which can lead to an abscess in the subcutaneous layer. In skin and soft tissue infections, ultrasound imaging is more reliable, which increases ability of clinicians to discern between an abscess cavity and deeper infections. It excels due to its high resolution and ability to perform dynamic testing, such as compressing structures, which allows for reliable separation of potentially perplexing physical findings. Sonography enables the discovery of clinically occult collections and provides guidance for diagnostic aspiration, which is often required to distinguish an abscess from a necrotic or cystic tumor, haematoma, or seroma. Here the authors presents a case of a 27-year-old male patient who presented with a discrete swelling on the right cheek region over a period of six months. Ultrasonography revealed a mysterious linear echogenic area surrounded by a hypoechoic area that was unusual of an abscess leading to perplexity in diagnosis. Later, the abscess was drained and the swelling had completely subsided after a week follow-up. Thus, a better understanding and knowledge of ultrasonography and its imaging features in soft tissue lesions will aid in precise diagnosis and may prevent unnecessary further imaging.

**Keywords:** Echogenic area, Folliculitis, Sonography

## CASE REPORT

A 27-year-old male patient reported to the Outpatient Department with a complaint of swelling with intermittent pain on the right cheek, which fluctuated in its size over the past six months. The patient revealed a history of acne flare-ups on the beard area for the past three years. He did not give history of any trauma specific to the area and had no relevant past medical history.

Extraoral examination revealed a discrete swelling on the right lower third of the face, extending superio-inferiorly from the line joining the corner of the mouth and the ear tragus to the lower border of the mandible, anteroposteriorly 2 cm from the corner of the mouth, and 4 cm in front of the angle of the mandible. The swelling was gradually increasing in size to the current size of approximately 3×3 cm with marked facial asymmetry. The swelling was moderately tender on applying pressure, soft to firm in consistency, which was positive for compressibility and negative for fluctuance. The skin over the swelling was devoid of hair and there was no evidence of pus or blood discharge neither any redness nor any local rise in temperature seen on the swelling [Table/Fig-1].

On intraoral examination, a traumatic fibroma was found on the right buccal mucosa opposite to 46,47, lateral to the fibroma a substantial mass was perceptible on palpation. Pit and fissure caries were seen

on 46,47 [Table/Fig-2]. No lymph nodes were palpable. Correlating the positive findings, buccal abscess in relation to 48 was given as a provisional diagnosis. Clinical differential diagnoses listed were sebaceous cyst, dermoid cyst, cysticercosis cutis, skin adnexal tumor, and metastatic lymph nodes.



**[Table/Fig-1]:** Extraoral pictures showing a discrete swelling of 3×3 cm on the right lower third of the face that was devoid of hair.



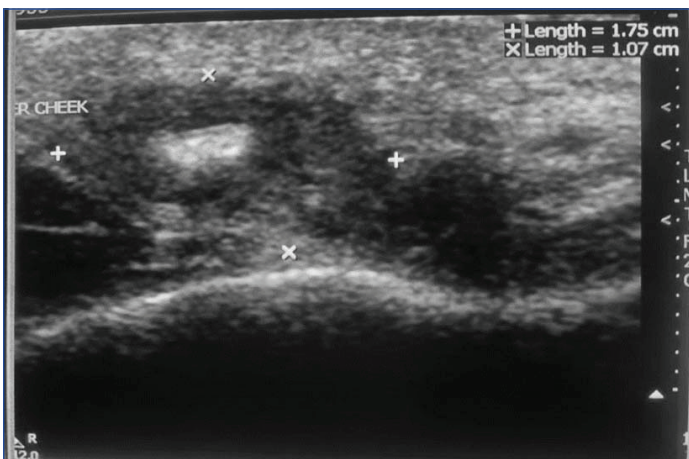
**[Table/Fig-2]:** Intraoral picture revealing a traumatic fibroma opposite to 46,47 with no correspondence with the extraoral swelling.

The patient underwent an Orthopantomogram (OPG) scan, which revealed no abnormalities that ruled out odontogenic causes [Table/Fig-3]. Ultrasound was performed on the patient to assess the soft tissue swelling, which revealed a 1.8×1.1 cm sized hypoechoic area seen in the right lower cheek with a 0.5 cm sized linear hyperechogenic area in the middle of the hypoechoic area along with indefinite acoustic enhancement with wide peripheral halo, indicating the presence of an abscess [Table/Fig-4]. Colour Doppler showed no significant vascularity including soft tissue pathological calcifications in the diagnostic spectrum. To confirm, a

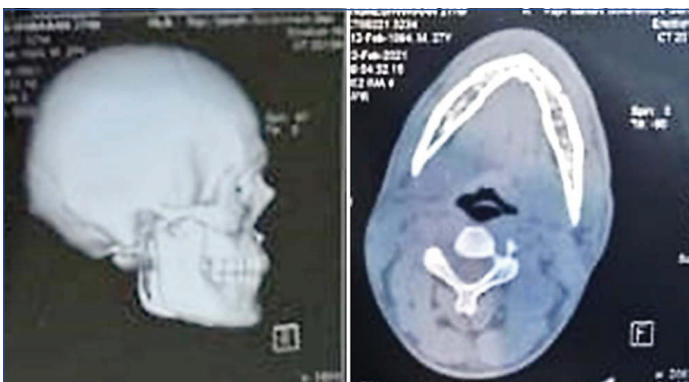
Computed Tomography scan was undertaken, which did not reveal any calcification pertaining to the area in axial section and in three Dimensional (3D) reconstructed image [Table/Fig-5], which led to the conclusive diagnosis of consolidated subcutaneous abscess of the right lower cheek as a complication of folliculitis due to the presence of central hyperechogenic area in the ultrasonography. Routine blood investigation was carried out that revealed normal limits of total White Blood Cell count of 6400 cells/cumm, differential count of neutrophils was 56%, lymphocytes 40%, eosinophils 4%, basophils 4% and monocytes 0%. Haemoglobin was 16 gm%, bleeding time was 2 minutes 10 seconds, and clotting time was 5 minutes 10 seconds.



**[Table/Fig-3]:** Orthopantomogram (OPG) revealing no abnormalities on the right mandible pertaining to the swelling.



**[Table/Fig-4]:** Ultrasonography (USG) showing 1.8x1.1 cm sized hypoechoic area seen in the right lower cheek with a 0.5 cm sized linear hyperechogenic area in the middle of the hypoechoic area.



**[Table/Fig-5]:** Computed Tomography (CT) 3D reconstructed and axial section revealing no bony lesions on the right mandible.

The patient was subsequently referred to the Department of Surgery for incision and drainage of the abscess, which contained pus and blood. Post-procedure, the patient was prescribed amoxicillin 500 mg twice daily and paracetamol 500 mg for pain for three days followed by a dressing the next day. After two days, the swelling had reduced in size and after a week of follow-up, the swelling had fully subsided with post-inflammatory hyperpigmentation over the drained area [Table/Fig-6].



**[Table/Fig-6]:** Follow-up picture showing completely subsided swelling and post-inflammatory hyperpigmentation.

## DISCUSSION

Ultrasound technology has advanced greatly in the previous decade, and it is now a valuable diagnostic tool for presenting both normal and pathological anatomy [1]. It aids in the diagnosis of cellulitis and abscesses in superficial soft tissue infections in the head and neck region [2]. The use of ultrasonography to distinguish between an acute abscess and a persistent consolidated abscess is highlighted in this case report. In ultrasonography, a transducer transmits high-frequency sound waves into the body, and reflections from the tissue interface are recorded and presented on a screen in diagnostic ultrasound [2]. The echoes of ultrasonography employ sound waves generated by the ultrasound probe to transform reflected sound energy into pictures. When sound waves strike something in the body, they bounce back stronger or weaker depending on the nature of the tissue. The image is subsequently presented as black (hypoechoic) to signify fluid, white (hyperechoic) to represent dense hard structures, and shades of grey to depict tissue compositions [3].

Sonographic appearance of abscesses in general are spherical in shape with irregular or lobulated borders, well-defined or ill-defined margins, merging in with the surrounding tissues. A cutaneous abscess' gray-scale appearance varies greatly depending on its location, maturity, and contents. The echogenicity of abscesses varies from anechoic to hyperechoic in comparison to surrounding structures. The classic sonographic appearance is an anechoic or hypoechoic complex fluid collection, which is easily perceived [4]. In solid-appearing abscesses, sonograms were examined for echogenicity, acoustic enhancements, abscess wall, and peripheral halo [5]. The hyperechogenicity is determined by the distribution of necrotic debris within the abscess.

The presence of necrotic tissue, debris, and breakdown products such as deoxyribonucleic acid and nucleoprotein, which are known to increase the viscosity of the abscess that could cause focal hyperechogenicity as transpired in the presented case. Any cavity that is filled with fluid will have a posterior enhancement. The case at hand had indefinite enhancement, indicating the presence of an abscess, however with the presence of central hyperechogenic area, which revealed consolidated abscess. The reason of which could be due to its long-standing maturity for about six months [5]. The abscess wall can be round or oblong appearing as a sharp echogenic wall, but might not be visible in all abscesses as in the above case which lacked an echogenic wall. The peripheral halo is an echo-free zone outside the wall of abscess which is a clear indicator of inflammatory lesion aiding a consideration of the case being inflammatory in origin [5].

The use of point-of-care ultrasonography, which uses portable ultrasound machine can aid in the differentiation of abscess from cellulitis. Clinical signs such as redness, warmth, and discomfort aid to rule out abscess when contemplating cellulitis. In more severe infections, such as necrotising fasciitis, subcutaneous thickening, free fascial fluid, and subcutaneous air, might be detected. In order to recommend appropriate treatment,



the sonographer must be familiar with numerous soft tissue ultrasonography results [6].

Differentiating feature of sebaceous cyst from subcutaneous abscess is the presence of punctum. Dermoid cyst has a main histological distinguishing feature from other types is the presence of keratinised stratified squamous epithelium and is also developmental in origin. Sonographically, the keratinous debris produces internal echogenicity, and if the debris fills the lumen, the entire cyst may appear completely solid. Cyst homogeneity may depend on the condition of the internal solution, ranging from fine homogeneity to heterogeneity [7]. The most common ultrasonographic appearance of a cysticercosis cutis is a cyst containing a scolex within and in surrounding abscess, which is absent in subcutaneous abscesses [8].

Colour doppler ultrasonography aids to differentiate lymph nodes pathologies by detecting its morphology and vasculature. Metastatic lymph nodes are more of round than oval or flat and lymphadenopathies has dense vasculature unlike abscess [9]. Skin adnexal tumours can be differentiated from chronic abscess by variety of clinical and histological examination [10]. The final diagnosis of the presented case can be substantiated by hair loss over the swelling which could be due to persistent chronic inflammation of hair follicles leading to subcutaneous abscess.

Ultrasonography can be used even as a guide for procedures like incision and drainage in real time [11]. Gudi SS et al., studied the efficacy of real time ultrasonography in location and drainage of abscess cavity of face as it is efficient and can avoid unnecessary scarring and hospitalisation [11]. Thus, ultrasonography is a convenient and radiation free modality useful for superficial lesions of the head and neck region.

## CONCLUSION(S)

In the present case, ultrasound revealed a hyperechogenic area in the middle of the hypoechoic area along with indefinite acoustic enhancement. Features of chronic abscess are not just limited to usual hypoechoic area with posterior acoustic shadowing but can also vary according to the presence of proteins and fibro-vasculature. Identifying soft tissue infections in the head and neck

region can be challenging at times. Ultrasonography plays a major role in diagnosing such lesions and it has the advantages of being a non invasive, easy availability, cost effective, non-radiation modality of examination that can also be performed on a chairside basis with modern technology. Therefore, expert interpretation should be done to avoid misdiagnosis.

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