ORIGINAL RESEARCH

Assessment of usefulness of ultrasonography as a diagnostic tool in the management of head and neck facial space infections

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ABSTRACT
Background: A substantial portion of the dental issues that patients bring to the hospital are caused by odontogenic infections. The present study was conducted to assess usefulness of ultrasonography as a diagnostic tool in the management of head and neck facial space infections. **Materials & Methods:** 104 patients with odontogenic infections of both genders were assessed clinically. The swelling was evaluated using a portable Acuson p50 ultrasound unit that produces high resolution images. **Results:** Out of 104 patients, males were 60 and females were 44. The maxilla was involved in 46 and mandible in 58 cases. Side was right in 42 and left in 62 cases. Tooth type was maxillary anterior in 23, maxillary posterior in 20, mandibular anterior in 25 and mandibular posterior in 36 cases. Clinical diagnosis was correctin 98 and incorrect in 6 cases. Ultrasound found to be correct in 102 and incorrect in 2 cases. The difference was significant ($P< 0.05$). **Conclusion:** Ultrasound is recommended as an adjunct to clinical examination in management of head and neck facial space infections.
Keywords: Odontogenic infections, Cellulitis, ultrasound

INTRODUCTION

A substantial portion of the dental issues that patients bring to the hospital are caused by odontogenic infections.[1] The majority of odontogenic infections develop in otherwise healthy individuals as a result of periodontal infections, pericoronitis, or pulp necroses brought on by trauma or caries. Most odontogenic infections are self-limiting and have the potential to drain on their own. On the other hand, these infections could aggressively expand and leak into the facial areas next to the mouth cavity, resulting in a more serious illness.[2] Subsequently, it could extend into the respiratory tract and central nervous system. Therefore, prompt measures are needed to provide a patent airway in addition to the necessary antibiotic therapy, debridement, incision, and drainage. It can be challenging to diagnose a facial space infection as cellulitis or an abscess clinically, but it's crucial since different therapies may be needed for each. Swelling might be firm or fluctuant, localized or diffuse.[3] Pus is present in a swelling if it is localized and palpable, giving the impression of fluid movement beneath the tissue. A diffuse swelling, also known as cellulitis, is defined as a swelling that penetrates neighboring soft tissue and dissects tissue gaps along fascial planes.[4]
Clinically, an abscess and cellulitis differ generally from one another. The first sign of an infection is cellulitis, which is believed to be an acute process.[5] Even THOUGH they are also acute, abscesses are frequently seen as the clinical swelling's resolution phase. Patients with cellulitis typically report more intense and widespread pain than the relatively limited discomfort connected to an abscess.[6] The present study was conducted to assess usefulness of ultrasonography as a diagnostic tool in the management of head and neck facial space infections.

MATERIALS & METHODS

The present study consisted of 104 patients with odontogenic infections of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. The swelling was assessed clinically. The swelling was evaluated using a portable Acuson p50 (Siemens, Munich, Germany) ultrasound unit that produces high resolution images. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table: I Distribution of patients

Total- 104		
Gender	**Male**	**Female**
Number	60	44

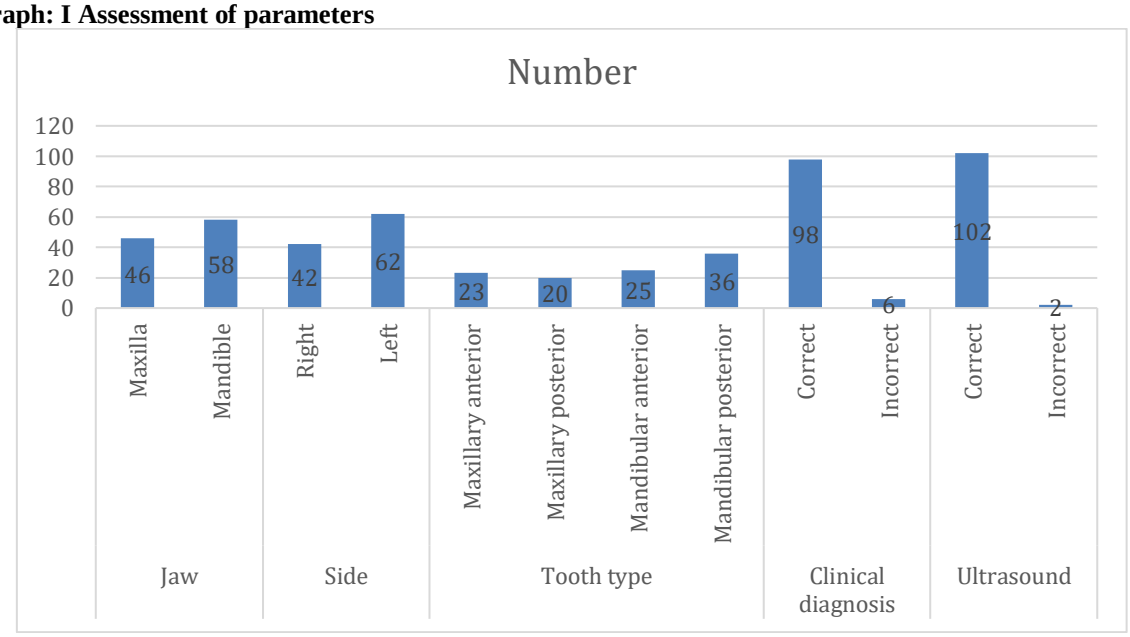
Table I shows that out of 104 patients, males were 60 and females were 44.

Table: II Assessment of parameters

Parameters	Variables	Number	P value
Jaw	Maxilla	46	0.71
	Mandible	58	
Side	Right	42	0.01
	Left	62	
Tooth type	Maxillary anterior	23	0.92
	Maxillary posterior	20	
	Mandibular anterior	25	
	Mandibular posterior	36	
Clinical diagnosis	Correct	98	0.02
	Incorrect	6	
Ultrasound	Correct	102	0.01
	Incorrect	2	

Table II, graph I shows that maxilla was involved in 46 and mandible in 58 cases. Side was right in 42 and left in 62 cases. Tooth type was maxillary anterior in 23, maxillary posterior in 20, mandibular anterior in 25 and mandibular posterior in 36 cases. Clinical diagnosis was correct in 98 and incorrect in 6 cases. Ultrasound found to be correct in 102 and incorrect in 2 cases. The difference was significant (P< 0.05).

Graph: I Assessment of parameters



DISCUSSION

Cellulitis is characterized by swelling, warmth, erythema, and soreness over the affected area; these symptoms are sometimes referred to as "tumor," "calor," "rubor," and/or "dolor." Cellulitis can be doughy or indurated in its hardness. Cellulitis that is stiffer and spreads more quickly usually indicates a more serious illness.[7,8,9] The present study was conducted to assess usefulness of ultrasonography as a diagnostic tool in the management of head and neck facial space infections. We found that out of 104 patients, males were 60 and females were 44. Shah et al[10] compared the accuracy of clinical examination alone versus ultrasonography (USG) in the diagnosis

of cellulitis and abscess in symptomatic patients with a diagnosis of superficial facial space infection. Twenty patients diagnosed as superficial facial space infections by clinical and radiographic examinations were included in the study. The provisional clinical diagnosis was made after a thorough history was taken and clinical examination was performed to determine if the swelling was a cellulitis or abscess. Swelling was then evaluated using the ultrasonic transducer which was placed over the swelling to aid the diagnosis which was again recorded. An incision and drainage procedure was performed after the administration of local anesthesia. The statistical analysis found that USG is a valuable diagnostic aid for detection of abscess or cellulitis in head and neck facial space infections. We observed that maxilla was involved in 46 and mandible in 58 cases. Side was right in 42 and left in 62 cases. Tooth type was maxillary anterior in 23, maxillary posterior in 20, mandibular anterior in 25 and mandibular posterior in 36 cases. Clinical diagnosis was correct in 98 and incorrect in 6 cases. Ultrasound found to be correct in 102 and incorrect in 2 cases. Peleg et al[11] examined the value of ultrasonography as a diagnostic tool in the treatment of superficial acute odontogenic fascial space infections. The study group consisted of 50 patients in whom both radiographic and sonographic examinations, as well as a needle aspiration, were performed. Purulent fluid was aspirated in 22 of the 50 patients. Six patients diagnosed as suffering from cellulitis had a repeated ultrasonography scan. In four, abscess formation was diagnosed on the third day. Ultrasonography is an effective diagnostic tool to confirm abscess formation in the superficial fascial spaces and is highly predictable in detecting the stage of infection. Tayal et al[12] evaluated the effect of diagnostic soft-tissue ultrasound (US) on management of emergency department (ED) patients with clinical cellulitis. Ultrasound changed the management of patients with cellulitis in 71/126 (56%) of cases. In the pretest group that was believed not to need further drainage, US changed the management in 39/82 (48%), with 33 receiving drainage and 6 receiving further diagnostics or consultation. In the pretest group in which further drainage was believed to be needed, US changed the management in 32/44 (73%), including 16 in whom drainage was eliminated and 16 who had further diagnostic interventions. US had a management effect in all pretest probabilities for fluid from 10% to 90%. The limitation of the study is the small sample size.

CONCLUSION

Authors found that ultrasound is recommended as an adjunct to clinical examination in management of head and neck facial space infections.

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