Original Research Paper

Radiodiagnosis

RADIOLOGICAL EVALUATION OF CHEEK MASSES

Dr. Rachna Chaurasia	Professor, Departmentof Radiodiagnosis, MLB Medical College, Jhansi, UP.
Dr. Kumari Saraswati*	Junior Resident, Department of Radiodiagnosis, MLB Medical College, Jhansi, UP. *Corresponding Author
Dr. Jitendra Singh Yadav	Associate Professor, Department of Otorhinolaryngology, MLB Medical College, Jhansi, UP

ABSTRACT Cheek are fleshy flaps, forming a large part of each side of face1 and covering the most parts of fascial space of face. Since the major purpose of imaging is to define the likely anatomic origin and categorise the masses into extra parotid and parotid as well as to analyse its nature by various radiological modalities, so this knowledge can aid the physician in narrowing down the list of possible maladies on the differential's diagnosis.

INTRODUCTION

The cheek is a convex area of either side of face constituting the faces largest anatomic and aesthetic constituent. (2) The boundaries of the cheek region include the superior margin at the infraorbital rim and zygomatic arch. Medially, the borders are at the naso-facial junction, naso-labial fold, and labio-mandibular crease. The inferior margin is the border of the mandible, and the preauricular crease is at the lateral border. (3)
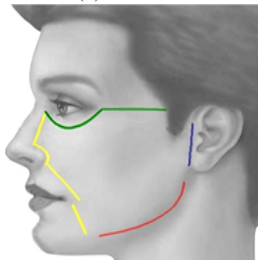

Fig 1: **Boundary of Cheek Region:** superior margin at the infraorbital rim and zygomatic arch (green). Medially, the borders are at the naso-facial junction, nasolabial fold, and labio-mandibular crease (yellow). The inferior margin is the border of the mandible (red), and preauricular crease (blue) is at lateral border.[2]

The cheek region is further subdivided intoextra-parotid and parotid region.

Cheek region
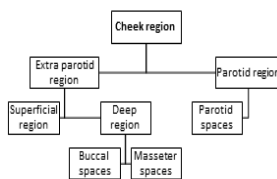
Any pathologies of these regions predominantly manifest as cheek mass other associated symptom could be facial pain, trismus, numbness, muscular weakness. [4]
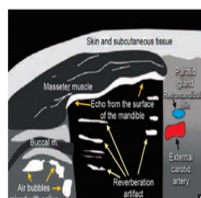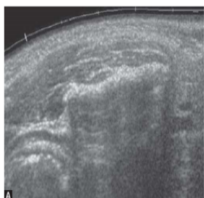

Fig.2: Transverse panoramic USG image (A) & corresponding diagram (B) show the normal anatomy of parotid gland & part of cheek[4]

Clinically looking cheek mass further divided into extra parotid and parotid mass and it is difficult to assess only by mean of clinical inspection and therefore imaging techniques are required to precisely evaluation.

AIMS AND OBJECTIVES

1)To categorise the cheek mass as parotid or extra parotid.
2)To analyse its nature by various modalities, so as to establish the correct diagnosis for its early management.

MATERIAL AND METHODS

The hospital-based observational prospective study was conducted over a period of 18 month[Feb 2018 to Sep 2019] in the department of Radiodiagnosis of MLB Medical College, Jhansi in collaboration of Department of ENT and other referral departments of MLB Medical College, Jhansi.

Inclusion Criteria

• Patients with a clinically suspected cheek mass.

Exclusion criteria

• Post-operative patients,
• Patients with contraindications to IV contrast medium,
• Pregnant females,
• trauma patients,
• Primary lesions of palate, tongue & bone

Method Of Collection Of Data

The study was performed on 120 patients of all age groups who came for radiological examination of cheek mass.

After taking informed consent & detailed history. All the patients were evaluated by USG to identify its imaging characters & grossly classified into parotid and extra parotid lesions, then followed by CT & MRI. Out of 120 cases, CT & MRI were done in 70 & 38 cases respectively, chosen by chit system. Rest of 12 cases were abscond / not given consent for further investigations, whereas all 120 patients were prospectively investigated by USG.

EQUIPMENTS:

1.Real time USG machine: medison SA 9900 prime with colour doppler & Sony thermal printer.
2.Real time USG machine: medison Sonoace X8 with colour doppler and Sony thermal printer.
3.Hitachi – AIRIS ELITE 0.3 TESLA MRI machine with Kodak dry view 6800 laser image printer.
4.PHILIPS- 16 slice CT machine.

OBSERVATION

Table 1: Distribution of cases according to extra parotid& parotid masses (n=120)

S.no.	Distribution of masses	No. of cases	%
1.	Extra parotid	84	70
2.	Parotid	36	30
	Total	120	100

Out of 120 cases of cheek masses 84 (70 %) were Extra parotid in origin, whereas 36 (30 %) were parotid.

Below table shows that the various extra parotid lesions the most common presentation in this group is of malignant neoplasm (61/84), abscess (9/84) show the second most common occurrence

Table 2: Distribution of extra parotid masses (n1=84).

S.no.	Etiologies	Diagnosis	Superficial	Buccal	Masseter	No. of cases	%
1.	Developmental	Accessory parotid	-	1	1	2	2.3
		Dermoid	-	1	-	1	1.1
2.	Inflammatory	Abscess	3	4	2	9	11
3.	Benign neoplasm	Epiderma inclusion cyst	5	-	-	5	5.9
		Lipoma	1	-	-	1	1.1
		Hemangioma	1	1	-	2	2.3
4.	Malignant neoplasm	Lymphoma	-	1	-	1	1.1
		Malignant	-	51	10	61	73
		Metastatic Lymph node of Buccal space	-	1	-	1	1.1
5.	*pseudolesion	Masseter hypertrophy	-	-	1	1	1.1
		Total	10	60	14	84	100

*Pseudo lesions: focal mass like condition without any lesion.

followed by epidermal inclusion cyst (5/84), accessory parotid (2/84) and haemangioma (2/84).

Table 3 : Distribution of parotid masses (n2=36)

S. No.	Etiologies	Diagnosis	no. of cases	%
1.	Cystic	Branchial cyst	1	2.8
		Sialocele	1	2.8
2.	Inflammatory	Sialolithiasis	2	5.6
		Sialadenitis	3	8.3
		Abscess	2	5.6
3.	Benign neoplasm	Pleomorphic adenoma	12	33.3
		Warthins	5	13.8
4.	Malignant neoplasm	Lymphoma	1	2.8
		Mucoepidermoid ca	5	13.8
		Adenoid cystic ca	2	5.6
		Carcinoma ex- Pleomorphic adenoma	1	2.8
		Metastasis	1	2.8
		Total	36	100

Out of 36 parotid masses, majority of them were pleomorphic adenoma 12(33.3%), followed by Warthin's5(13.8%) and mucoepidermoid carcinoma 5(13.8%), sialadenitis 3(8.3%), Sialolithiasis and & adenoid cystic carcinoma 2 (5.6%).

surrounding edema. (B)- Contrast enhanced axial CT showing diffuse masseteric thickening and mandibular sclerosis (due to adjacent chronic inflammatory process) with a discrete area of low attenuation (blue arrow).
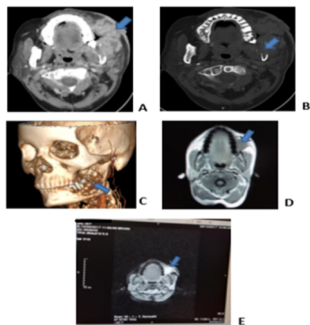

Figure 3: CA BUCCAL SPACE: A large solid, heterogenous enhancing mass lesion (arrow) in left buccal space (in FIGA) with bony erosion (in FIG B & C) (arrow) on axial CECT. (D)- On T1w there was isointense Mass lesion (arrow) in buccal space & showing heterogenous enhancement on T1w contrast imaging (FIG E) in same patient.
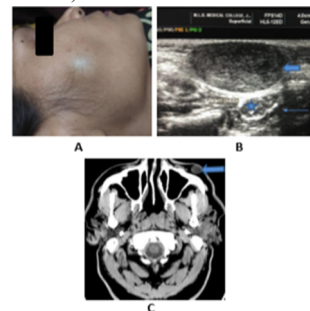

Figure 5: EPIDERMAL INCLUSION CYST (A) Right cheek swelling. (B) HRS scan showing well circumscribed oval shaped, predominantly hypoechoic mass (thick arrow) at subcutaneous plane showing posterior acoustic enhancement (asterisk) with lateral wall shadowing (thin arrow) consistent with sonographic image of cystic lesion. (C) Non contrast axial CT image showing fluid density mass (arrow) in another patient.
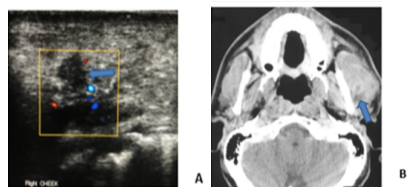

Figure 4: CHEEK ABSCESS (A) - USG showing focal, ill-defined, hypoechoic lesion (arrow) with perilesional vascularity &
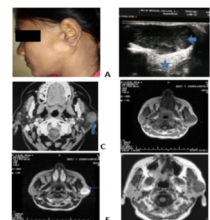
Figure 6: PLEOMORPHIC ADENOMA (A) Left cheek swelling (B) Ultrasound image shows a multilobulated hypoechoic mass with posterior acoustic enhancement (asterisk). (C) A different case with axial CECT image showed, dense homogeneous enhancement (arrow). (D) MRI axial T1w image of different patient showing well defined low signal mass with internal cystic changes. (E) axial T2w image: in homogeneous high signal with surrounding hypointense capsule (thin arrow). (F) axial T1Cw image: homogenous enhancement in another patient.

Figure 7: WARTHINS TUMOR (A) well defined, well marinated solid cystic mass. (B) Contrast enhanced axial CT image showing Heterogenous moderately enhancing lesion (arrow) within superficial lobe.
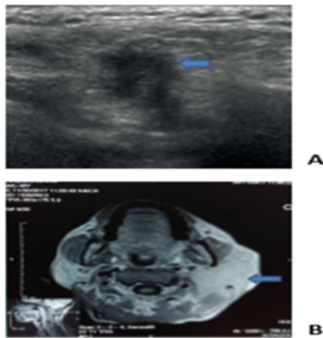

Figure 8: POORLY DIFFERENTIATED CA (A) USG showing poorly marinated ill-defined solid mass (arrow). (B) CET1W image showing A large poorly differentiated enhancing mass lesion (arrow) involving deep lobe.
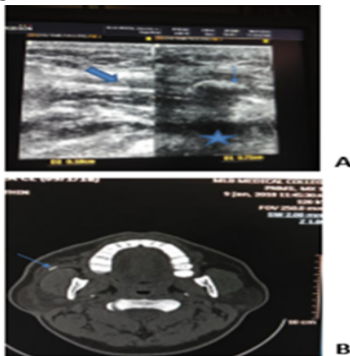

Figure 9: PAROTID DUCT CALCULUS (A) USG showing echogenic focus (thin arrow) with posterior acoustic shadow (asterisk) associated with dilated parotid duct (thick arrow). (B) Axial NCCT showing hyperdense focus (thin arrow) just anterior to masticator space opposite to upper2nd molar.

DISCUSSION

The preoperative differentiation of parotid from extra parotid lesions can be difficult by physical examination alone. Accurate localization is essential because the differential diagnosis and treatment of a parotid masses is quite different from extra parotid lesions. A total of 120 patients with clinically suspected cheek masses were included in our study.

Masses of cheek were classified into extra parotid & parotid in location. In our study majority of the cases were extra-parotid in origin.

In our study, out of 84 cases of extra parotid masses, (75%) cases were malignant in origin among which squamous cell carcinoma were in majority followed by inflammatory (11%) and benign neoplastic aetiologies (9.5%).According to Rashmeet Kaur et al (2017)[5] study, the most common lesions were of malignant aetiology (46.6%), amongst which squamous cell carcinoma (n=23) had the maximum incidence of 38.3%. The second most common group of lesions were inflammatory, i.e. 28.3%. The benign and congenital masses were the third most common lesions i.e. 23% of the total suprahyoid neck space lesions.

Our study demonstrate most common site for malignancy was buccal space than masseter space & majority of them were due to direct extension of adjacent structure malignancies.

In our study, amongst extra-parotid lesions, abscess was the most common inflammatory lesion and epidermal inclusion cyst was the most common benign extra-parotid lesion.

Out of 36 parotid space masses, benign neoplastic pathologies were majority in number i.e. (47.2%) followed by malignant which were (27.7%) than inflammatory- (19.5%) followed by cystic lesions which was (5.6%) which corresponds to Mohammed et al study (2008) [6], out of 242 patients 183 (75.6%) had benign neoplasm,51(21.1%) had malignant neoplasm and 8(3.3%) had inflammatory lesions.

Out of 17 benign parotid masses, pleomorphic adenoma was in majority (33.3%) followed by Warthin's (13.8%). According to study done by ZohrehJaafari- Ashkavandi et al (2013)[7] Pleomorphic adenoma is undoubtedly the most common Salivary gland tumor. Warthin's tumor was the second common benign tumor denoted by 10.5% of all cases.

In our study, most common malignant lesion was mucoepidermoid carcinoma (13.8%) followed by adenoid cystic (5.6%) which corresponds to (Daneshvar et al., 2011) [8] study.

USG is first imaging modality for localization of lesions whether parotid or extra parotid and good modality for superficial pathologies. Very sensitive for inflammatory and cystic pathologies.

Both CT and MRI were found to be accurate in depicting the origin and nature of lesions. [5]

CT allows better evaluation of abscess, sialolithiasis, calcifications and bony changes as well as metastatic cervical lymphadenopathy. [9]

Puffed cheek CT technique provides a clearer and more detailed evaluation of the gingival and buccal mucosa of the oral cavity. [10]

MR imaging has better soft tissue and contrast resolution in addition to no ionizing radiation exposure. [5]It can well demonstrate the Perineural spread of malignant tumours and intracranial or deep lobe of parotid gland extension of tumours. [11]

CONCLUSION

Extra parotid pathologies are more common than parotid. malignant pathologies are more common inextra parotid region, however benign are more common in parotid.

CT is better modality for extra parotid masses; however, MRI is better for parotid.

REFERENCES
1. Rajesh C Kamble et al.: Ultrasound Characterization of Salivary Lesions Otorhinolaryngology Clinics 5(4):16-29, January 2013.
2. Thomaidis Vasilios. Cutaneous flap in head and neck reconstruction (book),page no. 177.
3. Eric J Dobratz, Peter A Hilger. Cheek boundary-Cheek defects. Facial plastic surgery clinics of North America 2009.
4. Salivary gland tumor -symptom and cause-mayoclinic.
5. Rashmeet Kaur, Paramdeep Singh, Navkiran Kaur, Simmi Bhatnagar, Anshul Dahuja. Role of Computed Tomography (CT) in Localisation and Characterisation of Suprahyoid Neck Masses. Pol J Radiol, 2017; 82: 263-270.
6. Mohammed F, Asaria J, Payne RJ, et al. Retrospective review of 242 consecutive patients treated surgically for parotid gland tumours. J Otolaryngol Head Neck Surg 2008;37(3):340-6.
7. Zohreh Jaafari- Ashkavandi, Mohammad-Javad Ashraf, Maryam Moshaverinia.

Salivary Gland Tumors: A Clinicopathologic Study of 366 Cases in Southern Iran
DOI:http://dx.doi.org/10.7314/APJCP.2013.14.1.27

8. Daneshvar S, I Moshref M, Eshghyar N, et al (2011). Intra-oral minor salivary gland
    tumors: a Clinicopathological Study of 412 cases. 89th General Session and
    Exhibition of the IADR, San Diego Convention Center, California, USA, March 17.

9. Nezahat Erdogan, Erdogan Bulbul, Murat Songu, Engin Uluc, Kazim Onal, Melda
    Apaydin, Huseyin Katilmis, Puffed-cheek computed tomography: A dynamic
    maneuver for imaging oral cavity tumors ENT-Ear, Nose& Throat Journal,
    September2012.

10. Puffed cheek Ct technique as an imaging protocol for the evaluation of oral vestibule,
    KB TaBTaori, K Mitra, SV Kimmatkar - Indian Journal of Radiology and Imaging,
    2002 - ijri.org.

11. Roger P Tart, Ilona M. Kotzui Anthony A. Mancuso, Melissa S. Glantz, Sures/i K
    Mu/therfi,: CT and MR Imaging of the Buccal Space and Buccal Space Masses.