COMPARATIVE STUDY BETWEEN MAGNETIC RESONANCE IMAGING AND FINE NEEDLE ASPIRTION CYTOLOGY IN PREOPERATIVE DIAGNOSIS OF PAROTID TUMORS

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Introduction

Parotid tumors constitute 80 percent of all salivary gland tumors. Around 80% of parotid tumours are benign, pleomorphic adenomas are the most common benign types. Mucoepidermoid carcinoma is the most common salivary malignancy.

There are many diagnostic tools that can be used to reach a final diagnosis of parotid lesions such as: ultrasound imaging, computerized tomography, magnetic resonance imaging and fine needle aspiration cytology. The correct diagnosis before operation is important for the surgeon in order to determine the best surgical procedure.

Ultrasound is efficient for examining superficial structures in the neck, and of great value in assessing salivary gland disease and lymph nodes, but due to attenuation of the sound beam as it passes through the tissues and inability to penetrate bone, cartilage and gas, examination of large necks and deep structures, such as the deep lobe of the parotid becomes more difficult. Also ultrasound is inappropriate for local staging of many primary head and neck cancers.

Magnetic resonance imaging (MRI) is another investigation tool which is superior to ultrasound in detecting parotid tumor location especially in the deep lobe, and provides better results than computerized tomography (CT) in providing anatomic information and displaying the relationship of the mass with contiguous structures.

The MRI findings were of great value in distinguishing benign from malignant parotid gland tumors when biopsy results are non-diagnostic.

Salivary gland tumors are an uncommon entity with highly varied histopathological assessment due to heterogeneous cellular composition. Fine-needle aspiration cytology (FNAC) is a good investigation tool to differentiate benign from malignant parotid tumors, oftentimes FNAC is non diagnostic or yielding false positive or false negative results.

Aim of the work

The aim of this work was to compare the accuracy of magnetic resonance imaging (MRI) to fine needle aspiration cytology (FNAC) in the preoperative diagnosis of parotid tumors.

Patients and Methods

PATIENTS: Sixty patients with parotid lesions participated in a comparative study from June 2019 to April 2021 . Each was investigated by MRI then FNAC from the lesion.

After surgery results were compared to the final histopathological examination.

Exclusion criteria: Patients with recurrent parotid lesion, Patients with autoimmune disease of salivary glands, History of neck radiotherapy.

METHODS: All patients in the present study were subjected to:

-MRI diffusion of neck

-US guided fine needle aspiration cytology from Parotid swelling

-Histopathological examination of the specimens

Results

Table 1: Agreement (sensitivity, specificity and accuracy) for FNAC (n = 60)

FNAC	Histopathology				Sensitivity	Specificity	Accuracy
	Benign (n = 54)		Malignant (n = 6)				
	No.	%	No.	%			
Benign	51	94. 4	1	16. 7	33. 3	94. 4	88. 3
Indeterminate	3	5. 6	3	50. 0			
Malignant	0	0. 0	2	33. 3			
$c^2(^{MC}p)$	20. 362* (<0. 001*)						

Table 2: Agreement (sensitivity, specificity and accuracy) for MRI (n = 60)

MRI	Histopathology				Sensitivity	Specificity	Accuracy
	Benign (n = 54)		Malignant (n = 6)				
	No.	%	No.	%			
Benign	52	96. 3	1	16. 7	83. 3	96. 3	95. 0
Malignant	2	3. 7	5	83. 3			
$c^2(^{FE}p)$	33. 226* (<0. 001*)						

Table 3: Agreement (sensitivity, specificity and accuracy) for combination of FNAC & MRI (n = 60)

Combination of FNAC & MRI	Histopathology				Sensitivity	Specificity	Accuracy
	Benign (n = 54)		Malignant (n = 6)				
	No.	%	No.	%			
Benign	52	96. 3	0	0. 0	100. 0	96. 30	96. 67
Malignant	2	3. 7	6	100. 0			
$c^2(^{FE}p)$	43. 333* (<0. 001*)						

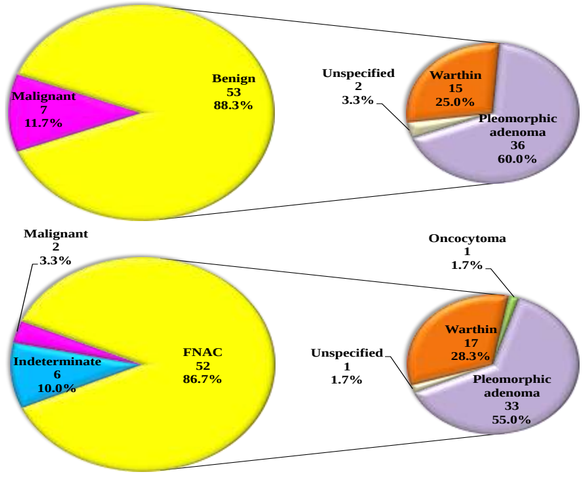

Figure 1: Distribution of the studied cases according to subtype of MRI (n=60)

Figure 2: Distribution of the studied cases according to subtype of FNAC (n=60)

Conclusion

- Although FNAC is a good positive diagnostic tool, it is of low sensitivity in malignant parotid tumor according to this study.
- Magnetic resonance imaging is more accurate than fine needle aspiration cytology in confirmation of parotid tumors.
- The reliability and associated anatomic information of MRI in parotid gland tumor diagnosis make MRI the test of choice in our practice. Cytology is of main importance, despite having a higher indeterminate rate than MRI. Conversely, FNAC leads to more specific histological diagnoses.
- The choice of modality has to be made by the surgeon depending on the availability of local medical resources and the cost-effectiveness of management.

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