Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19959
DOI URL: http://dx.doi.org/10.21474/IJAR01/19959

RESEARCH ARTICLE

PAROTID TUMORS: MRI AND PATHOLOGIC EXAMINATION OF 50 CASES

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Manuscript Info

Manuscript History
Received: 17 September 2024
Final Accepted: 27 October 2024
Published: November 2024

Key words:-
Parotid, MRI, Pathology, Risk Factors

Abstract

Parotid tumors account for 80% of salivary gland tumors and are benign in 80%. Pleomorphic adenoma is the most common benign tumor.Malignant tumors account for 10 to 20% of parotid tumors and are dominated by mucoepidermoid carcinoma.Magnetic resonance imaging is crucial in the diagnosis of these tumors and can suggest the histologic type.We report a series of 50 patients followed in the ENT department of HMI-MV who underwent surgery for a parotid gland tumorThe aim of our work is to focus on the radiological aspects of parotid tumors (MRI) and to correlate with the definitive anatomical pathological result; this will confirm that the MRI aspects of parotid tumors can orient towards the histological typeOur study showed that MRI aspects of these tumors can be used for histological diagnosis and have the same predictive value as pathological examination of the parotid gland.

Introduction:-

Parotid tumors account for 80% of tumors in the major salivary glands and develop mainly in the parotid glands, located near the ears. These tumors may be benign, such as a pleomorphic adenoma, or malignant, such as mucoepidermoid carcinoma. Distinguishing between these two types is crucial for accurate diagnosis and appropriate treatment planning [1, 2].

MRI is recognized as a leading diagnostic tool because of its ability to provide detailed soft tissue images. It is particularly effective in differentiating benign from malignant tumors by analyzing characteristics such as size, homogeneity and tumor margins [3, 4]. In addition, MRI allows accurate localization and assesses local extension, which is essential for surgical management [5].

Pathologic examination, based on tumor samples obtained by biopsy or surgery, remains the gold standard for diagnosis. This test classifies tumors according to their histologic characteristics, offering valuable indications for prognosis and treatment [6].

Objective:-

This retrospective study aims to:

- Assess MRI characteristics of parotid tumors.
- Consider agreement with pathologic findings.

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- Identify the main risk factors for malignancy.

Methodology:-

1. Population studied

· 50 patients followed between 2018 and 2022 at Mohammed V Military Hospital.

· Data analyzed: age, gender, smoking, alcohol consumption, and family history of cancer, duration of symptoms, and MRI and histological findings.

2. MRI imaging

· Parameters evaluated: homogeneity (homogeneous or heterogeneous), margins (regular or irregular) and tumor size.

· MRI performed with T1, T2 sequences and after gadolinium injection [7].

3. Pathologic analysis

· Postoperative biopsies or specimens allowed detailed histological classification [6].

4. Statistical analysis

· Univariate tests: ANOVA, chi-square to explore associations.

· Multivariate analysis: Logistic regression to identify independent predictors of malignancy.

Results:-

1. Characteristics of patients

· Average age: 53.9 years.

· Gender distribution: 52% male, 48% female.

· Average duration of symptoms: 5.1 months.

· Risk factors: 46% were smokers, 48% were alcohol users, and 30% had a family history of cancer [8].

2. MRI characteristics

·Homogeneity:

O Homogeneous tumors: 56%, of which 10% were malignant.

O Heterogeneous tumors: 44%, with malignancy observed in 77% ($p < 0.05$).

·Margins:

O Regular margins: 56%, associated with malignancy in 25%.

O Irregular margins: 44%, with a malignancy rate of 59% ($p = 0.015$).

·Size:

O Average size: 3.95 cm.

O Neoplasms benign: 3.5 cm.

O Malignancies: 4.5 cm ($p < 0.05$).

3. Histological analysis

·Neoplasms benign: 60%

O Pleomorphic adenoma: 40%.

O Cystadenolymphoma: 20%.

· Malignancies: 40%

O Mucoepidermoid carcinoma: 30%.

O Others (adenoid cystic carcinoma, acinar cell carcinoma): 10%.

4. Analysis of risk factors

·Advanced age: Patients > 60 years: 78.6% malignancy ($p=0.002$).

·**Family history:** Significant increase in risk ($p < 0.05$).

·Duration of symptoms: Patients who visited after 6 months had increased malignancy.

·Smoking: Although common, was not significant in multiple analysis

Discussion:-

Analysis of Results

MRI correlations and histology

Results show that heterogeneity and irregular margins on MRI **are** reliable indicators of malignancy. These findings are consistent with previous studies, such as that of Ondzotto et al., 2010, which demonstrated that MRI can differentiate malignant from benign tumors with high sensitivity [1].

Risk factors
Family history of cancer and advanced age remain the main factors of malignancy, as highlighted by Allouch et al., 2020 [2].

Comparison with other studies
·Tumor size: Malignant tumors were significantly larger, an observation corroborated by Ben Rahal et al., 2018 [10].
·Homogeneity and margins: Irregular margins and heterogeneity are reliable indicators, in line with the work of Jeong et al., 2019 [9].

Clinical Implications
The use of MRI for diagnosing parotid tumors offers several important clinical advantages. First, MRI's ability to provide detailed soft tissue images allows for a more precise assessment of the local tumor extension, which is crucial for surgical planning. Additionally, accurate tumor characterization by MRI can help avoid unnecessary biopsies and guide therapeutic choices more optimally.

Study Limitations
While our study shows promising results, it has certain limitations. The number of patients included in the study is relatively small (50 cases), which may limit the generalizability of our findings. Furthermore, being a retrospective study, it is subject to certain biases, including selection and classification biases. Prospective studies with larger samples would be needed to confirm these results.

Future Perspectives:-
Future developments in magnetic resonance imaging, such as improved acquisition sequences and the integration of advanced techniques like diffusion MRI and spectroscopy, could further enhance the diagnostic accuracy of MRI for parotid tumors. Moreover, further research is needed to explore the use of MRI in postoperative monitoring and early detection of recurrences.

Conclusion:-
This study confirms the usefulness of MRI in the diagnosis of parotid tumors, particularly in differentiating benign from malignant tumors. MRI characteristics, combined with age and medical history, allow accurate assessment of risk of malignancy. These findings reinforce the importance of a multidisciplinary approach that integrates advanced imaging and pathology.

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