ORIGINAL ARTICLE / *ENT*

Warthin's tumor of parotid gland: Surgery or follow-up? Diagnostic value of a decisional algorithm with functional MRI

CrossMark

S. Espinoza*, A. Felter, D. Malinvaud, C. Badoual, G. Chatellier, N. Siauve, P. Halimi

Service de radiologie, hôpital Européen Georges-Pompidou, 20, rue Leblanc, 75015 Paris, France

Abstract

Purpose: Warthin's tumor is the second most frequent benign tumor of the parotid gland, with no risk of malignant evolution. That is why surgery should be avoided if the preoperative diagnosis is certain. The aim of the study was to assess the added value of a decisional algorithm for the preoperative diagnosis of Warthin's tumor.

Materials and methods: This retrospective IRB-approved study included 75 patients who underwent standardised MRI with conventional sequences (T1- and T2-weighted images, and T1 post-contrast sequences with fat saturation) and functional sequences: diffusion (b0, b1000) and perfusion MR. Two independent readers reviewed the images using the decisional algorithm. The conclusion of each reader was: the lesion is or is not a Warthin's tumor. The MRI conclusion was compared with histology or with cytology and follow-up. We calculated the Cohen's kappa coefficient between the two observers and the sensitivity and specificity of the algorithm-helped-reading for the diagnosis of Warthin's tumor.

Results: Seventy-five patients; histology ($n = 61$) or cytology and follow-up ($n = 14$) results revealed 20 Warthin's tumors and 55 other tumors. Using the algorithm, sensitivity and specificity were 80—96%, and 85—100%, respectively for readers 1 and 2. The Cohen's kappa coefficient between the two observers was 0.79 ($P < 0.05$) for the diagnosis of Warthin's tumor.

Conclusion: Our decisional algorithm helps the preoperative diagnosis of Warthin's tumor. The specificity of the technique is sufficient to avoid surgery if a parotid gland tumor presents all the MRI characteristics of a Warthin's tumor.

© 2014 Éditions françaises de radiologie. Published by Elsevier Masson SAS. All rights reserved.

* Corresponding author.
  E-mail address: sophie.espinoza@gmail.com (S. Espinoza).

Warthin's tumor is the second most frequent benign tumor of the parotid gland (the first one is pleomorphic adenoma) [1]. This parotidian tumor occurs most often in smokers [2], in middle-aged and older men [3]. It is usually located at the inferior pole of the gland and multicentric occurrence is seen more often with Warthin's tumor than with any other salivary gland tumor [4]. Unlike pleomorphic adenomas, Warthin's tumor presents less than 1% risk of malignant evolution [5]. That is why surgery is not necessary when the preoperative diagnosis is certain and surgery should be avoided as often as possible because of the risk of facial nerve injury during surgery [6,7].

In this clinical context, when faced to a parotid gland tumor, MRI [8—12] and fine needle aspiration cytology (FNAC) are widely used before surgery [6,13]. FNAC is the most cost effective and minimally invasive way to determine the histological character of a parotid gland tumor. But, it is not always conclusive because the material may be insufficient. Furthermore, in case of Warthin's tumor, which contains inflammatory cells, FNAC can be responsible for an inflammatory flare with pain and volume increase of the lesion [14]. On the other hand, MRI accuracy for the diagnosis of Warthin's tumor has never been clearly reported, since in most studies, the aim was to distinguish the difference between malignant and benign lesions, pooling pleomorphic adenomas and Warthin's tumors [8—12]. As far as we know, there is only one study about Warthin's tumor and its MR diagnosis value [15], but the sensitivity and specificity of the technique are not reported in this study. That is why most surgeons are still going on surgical treatment for these benign tumors, despite of the risk of facial palsy [16]. Furthermore, to our knowledge, all the MR imaging studies tested the interest of anatomical sequences and/or functional sequences [8—12], but no study tested the interest of the whole examination, including all the available MR imaging data, it means: morphology, signal, diffusion with apparent diffusion coefficient (ADC) map, and dynamic contrast-enhanced MR imaging with time—intensity curve pattern, in order to establish the value of MR imaging for the diagnosis of Warthin's tumor. We have published a decisional algorithm for the interpretation of parotid gland tumor MR imaging, taking into account all the MRI data, including functional data [17].

The aim of the study was to assess the added value of our decisional algorithm for the preoperative diagnosis of Warthin's tumor.

Methods and materials

Patients

Between January 2006 and December 2012, our MR imaging database was retrospectively queried to identify all patients who underwent contrast-enhanced MR imaging of parotid gland ($n = 1039$). Patients with no parotid gland abnormality ($n = 901$; most often these MR examinations corresponded to MR follow-up after surgery), with inflammatory disease ($n = 6$) or with incomplete MR imaging ($n = 8$) where excluded. Mainly cystic lesions ($n = 3$) were excluded because it was not possible to place a region of interest in a tissular part, and then diffusion and perfusion sequences could not be analysed. Lesions less than 10 mm in diameter were excluded ($n = 2$) because they corresponded to
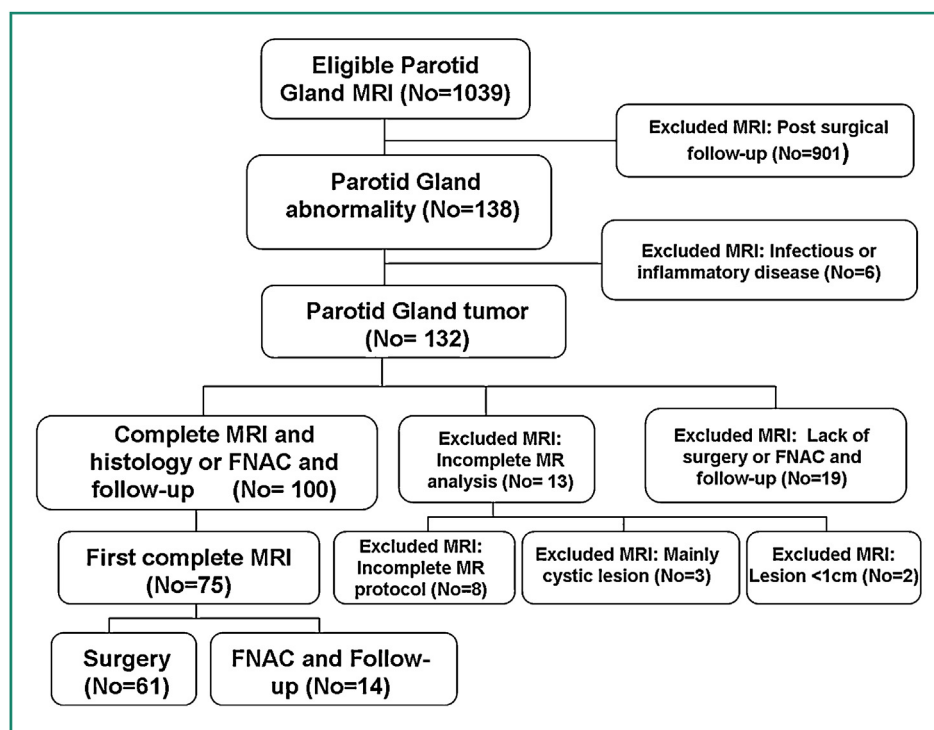

Figure 1. Flowchart shows patient population. Only the first complete MR imaging was selected. The final cohort included 75 patients. FNAC: fine needle cytology aspiration.