

ROLE OF MRI IN PAROTID GLAND LESIONS

THESIS

Submitted for Partial Fulfilment for
The Master Degree of Radiodiagnosis

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1992





To...

My FAMILY

Acknowledgement

I am greatly honoured that I have worked under the supervision of Professor Dr. Nawal Zakaria, Head of Radiology Department, Faculty of Medicine, Ain Shams University. Without her guidance, kind help and support, the accomplishment of this work could not be a fact.

I am also deeply grateful to Dr. Mohammed Zaki, Lecturer of Radiodiagnosis, Faculty of Medicine, Ain Shams University for his generous help and moral support.

I would like to thank Dr. Yasser Abdel Azeim for kindly reviewing the physics and the technical aspects of this work.

I would like to express my sincere gratitude to all Professors & Staff Members as well as my colleagues of Radiodiagnosis Department.

Laila

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INTRODUCTION AND AIM OF THE WORK

Introduction and Aim of the Work

Parotid glands were at once a problem in the diagnosis of their lesions. The favoured modality for imaging the parotid has evolved from plain film to sialography to computed tomography (CT) over the last several years.

The introduction of Magnetic Resonance into the world of imaging modalities provided a mean of noninvasive imaging of the parotid gland, with excellent soft tissue contrast.

The aim of this work is to evaluate the role of MRI in the diagnosis of different parotid gland lesions and to demonstrate the characteristics of these lesions on M.R.

In order to fulfill this aim, a short review of the different imaging modalities used to assess the parotid gland is essential.

IMAGING MODALITIES FOR THE EXAMINATION OF THE PAROTID GLAND



Fig. (1-1): Plain radiography, lateral view.
(Quoted from Kamel F., 1985).



Fig. (1-2): Plain radiography, anteroposterior view.
(Quoted from Kamel, F., 1985).

Imaging Modalities for the Examination of the Parotid Gland

Imaging of the parotid glands has primarily involved:

1. Plain films,
2. Ultrasonography,
3. Sialography for definition of intraductal lesions,
4. Radionucleid scanning for evidence of "hot" or "cold" masses,
5. Recently CT has had a revolutionary effect on the radiological examination of mass lesions in and around the parotid (**Rabinov et al., 1984**).
6. And more recently, MR imaging allows much better visualization of masses in the parotid glands.

Plain film:

Plain films are obtained to evaluate possible radio-opaque calculi, bony erosions of the mandible or calcifications.

Lateral (Fig. 1-1) anteroposterior (Fig. 1-2) or tangential anteroposterior views can be taken. The last is usually preferred for the gland to be visualized free from the overlapping bones. Films are taken with slightly lower KVP technique than routine mandibular views, to allow better

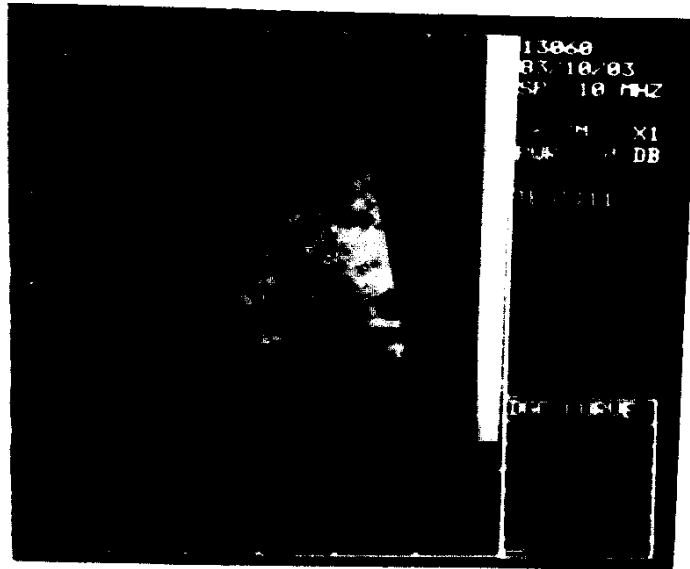


Fig. (1-3): Sialolithiasis. Ultrasound shows an echogenic focus (white arrow) casting an acoustic shadow (black arrow). The gland is enlarged and hypoechoic, consistent with sialadenitis.
(Quoted from Wittich, et al., 1985).



Fig. (1-4): Acute sialoadenitis of the parotid gland shows irregular gland structure due to presence of multiple hypoechoic areas (dilated ducts).
(Quoted from Rubaltelli et al., 1987).

visualization of the paramandibular soft tissues (**Kamel, F., 1985**).

Ultrasound:

Wittich et al., in 1985, stated that ultrasound is superior to plain films in the detection of parotid gland stones (Fig. 1-3), because of its ability to detect non-opaque stones. Ultrasound can detect intraglandular calculi more easily than intraductal one, especially when the main duct is not dilated. Furthermore, the exact location of a stone can be defined sonographically; and some associated pathological features, such as gland swelling, ductal ectasia and irregular echostructure, can be visualized.

Gritzmann in 1989 stated that because performing sonography is more time consuming than obtaining plain films, they are obtained first in patients with clinically suspected sialolithiasis. If plain films are normal, or when the exact localization of a calculus is unclear, sonography should be performed. When both plain films and sonography are normal, sialography is performed.

The aim of sonography in acute inflammation is to rule out sialectasia and to confirm or exclude the presence and extent of abscess formation (Fig. 1-4 & 1-5) (**Gritzmann, 1989**).

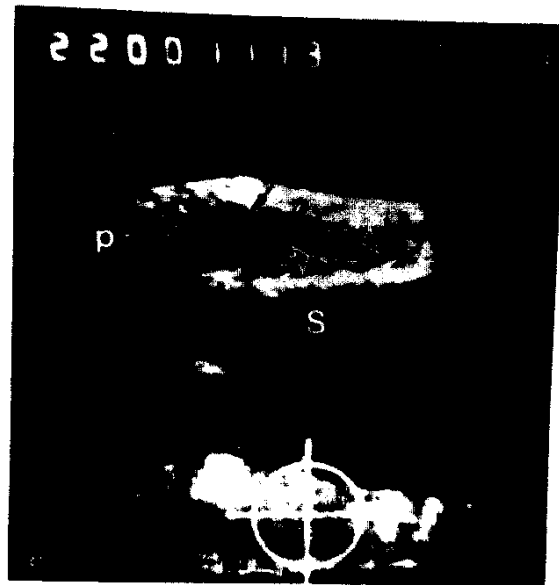


Fig. (1-5): Abscess of the parotid gland. 1 cm hypoechoic lesion within the superficial lobe. Visible proximal portion of dilated stenosis's duct (open arrow).

S= shadow from mandible

a= anterior

p= posterior

(Quoted from Wittich et al., 1985).



Fig. (1-6): Pleomorphic adenoma of the parotid gland with malignant degeneration. The superficial part of the tumour has sharp border. In deep portion of the gland, tumour is ill-defined (black arrow) and is adjacent to vessels (white arrow).

(Quoted from Gritzmann, 1989).

Wittich et al., in 1985, stated that the sensitivity of the ultrasound in detecting parotid tumours appears to approach 100% (Fig. 1-6), and is more accurate for establishing the intraglandular versus extraglandular location of a lesion. Compared to CT, ultrasound is less expensive, and is not hampered by the presence of dental fillings or motion artifacts and does not require I.V or intraductal contrast injections, but CT is superior to sonography for documenting infiltration into the parapharyngeal soft tissue and is able to show bone infiltration.

The disadvantage of U/S is that it cannot visualize the facial nerve; and the anterior extension of the deep lobe is obscured by the mandible in the axial plane perpendicular to the ear lobe (**Seibert et al., 1986**).

Sialography:

For more than half a century conventional sialography was the most widely accepted method for radiographic examination of the parotid gland. The limitations of sialography in parotid gland assessment led to controversy regarding its usefulness as a diagnostic tool. Currently, the primary application of sialography is in the evaluation of the ductal system.