EVALUATION OF FINE NEEDLE ASPIRATION BIOPSY WITH HISTOPATHOLOGIC REFERENCE TESTING IN THE DIAGNOSIS OF CANCER OF THE PAROTID GLAND

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INTRODUCTION

In the evaluation of the neoplastic diseases of the parotid gland, the clinical features and imaging do not allow an accurate distinction among benign and malignant lesions. For this reason Fine Needle Aspiration Biopsy (FNAB) has had an increasing role in the preoperative diagnosis of parotid neoplasias. Safe, rapid and cost –effective alternative. However, there is still controversy in its usefulness in the study of neoplastic lesions with great divergence among several validation studies. In addition, in Latin America it has not been evaluated before.

Objetive

Evaluate the accuracy of fine needle aspiration cytology in the diagnosis of cancerous lesions of the parotid gland using the final histopathological exam of the gland as the gold standard.

MATERIALS Y METHODS

Study Subjects and Samples

The study included patients of 7 health institutions: Hospital Universitario de Santander, Clínica Chicamocha, Clínica Comuneros, Clínica Carlos Ardila Lulle, Clínica Bucaramanga, Clínica de SaludCoop and Clínica Metropolitana, located in Bucaramanga, Colombia, between 2004 and 2005. The study subjects were seen at the head and neck unit due to palpable masses in the parotid area. Clinical interview and FNABs were performed by head and neck surgeons.

The slides were PAP stained and interpreted by cytopathology-certified pathologists without the knowledge of the subject's clinical data. Diagnostic results were classified based on the World Health Organization (WHO).

After 30 to 60 days a partial vs. total parotidectomy performed by head and neck surgeons and the surgical specimens were submitted for histopathological evaluation. Hematoxilin-eosin stained slides were reviewed by surgical pathologists without patient knowledge of the clinical data and FNAB results The resulting diagnosis was classified using the WHO classification.

Figure 1. Sample Study

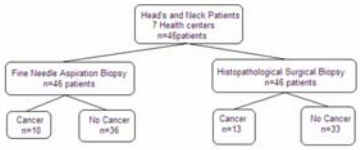

Table 1. 2x2 square

		Reference test (Histopathological Diagnostic)		
Evaluated test (FNAB)		Positive	Negative	Total
	Positive	7 (VP)	3 (FP)	10 (Q)
	Negative	6 (FN)	30 (VN)	36 (Q')
	Total	13 (P)	33 (P')	46 (No)

Ethical aspects.

This research was performed according to the national (1991 National Constitution, resolution 008430 of 1993) and international (Helsinki's declaration) legislation and Was approved by the health authorities of the institutions involved and cataloged as research without risk like.

Analysis.

The sample size (45 patients) was calculated by the Kraemer method. The sensitivity (s), Specificity (SP), the positive predicitive value (PPV) and negative predictive value (NPV), the likelihood ratio (+ and -) and Kappa were calculated by cross sectional sampling. Epi Info 2004 (CDC, USA), and Stata 9.0 software were used in the statistical analysis . A total of 46 patients were studied, 58.7% (27 patients) were female.

RESULTS

A total of 46 patients were studied, 58.7% (27 patients) were female. The age distribution ranged from 22 to 80 years old with a mean age of 51.78 ± 16.32 years .

Table 2. Performance values of the FNAB for the diagnosis of parotid gland carcinoma

	Value (%)	95% confidence Interval
Sensitivity	53.8	25.1 – 80.8
Specificity	90.9	75.7 – 98.1
PPV	70	34.8 – 93.3
NPV	83.3	67.2 – 93.6
LR +	5.92	1.8 – 19.5
LR -	0.508	0.279 – 0.922
Kappa	48.12	33.6 – 62.64
Prevalence	28.26	14.16 – 42.36

DISCUSSION

Parotid gland FNAB is largely used due to the implicity and minimal risk associated with the procedure although is not entirely accurate. This has been associated to a number of factors.

In our study FNAB had a 53.8% moderate sensitivity and 90.9% high specificity, indicating their usefulness to confirm a diagnosis rather than to detect the healthy population. The NPV was good. The PPV was not efficient, indicating a high rate of false positives. The (+) and (–) LR show a small but important change in the likelihood of having or not a cancerous lesion, based on a positive or negative result. Lastly a 48.21% kappa value shows a poor correlation among the FNA and tissue histopathology with an important divergence in the results.

It is of special interest the great divergence of the results among different series. With sensitivity for malignant lesions ranging from 38 to 97% and specificity between 82 and 100%.

In our study 3 false positives were identified (6.5%) all corresponded to pleomorphic adenomas, on the other hand, 6 false negatives (13%) were documentd which corresponded to adenoid cystic carcinoma (2 cases), lymphoma (2 cases), mucoepidermoid carcinoma (1 case), and acinar cell carcinoma (1 case). These are also consistent with the commonest false results previously reported.

However, it should be made clear that this study is not deficient, in this stage that is is used it isn't the only test to clarify the type of lesion that has compromised the gland, except that it is part of the total preoperative diagnostic study that is done. If it is done in conjunction with an adequate clinical and imaginological exam, and the results of the exams are in conjunction, the preoperative approximation is sufficiently precise that is the reason that these 3 combined tools are recommended

In conclusion, our study of FNAB had an average accuracy in the diagnosis of parotid gland cancer, this coincides with other studies that have been done. The low sensitivity and negative likelihood ratio limits its usefulnes as a screening technique and the low kappa demonstrates a poor correlation with final histopathological evaluation. For this reason it is recommended to improve the criteria used in its interpretation, as well as to emphasize the use of new technologies that allow a valid and precise diagnosis of this pathology with a cost –effective and easy to implement approach.

BIBLIOGRAPHY

- Cancer. 1998 Jun 25;84(3):153-9.
- Rev Laryngol Otol Rhinol (Bord) 1984;105(1):21– 4.
- Br J Surg 1989;76:1273–4.
- Laryngoscope 2001; 111:1551–1557.
- Curr Opin Otolaryngol Head Neck Surg. 2006 Apr;14(2):62-66.
- Acta Cytol 1985;29:503–12.
- Ir J Med Sc 1998;167:149–151.
- Med Clin North Am 1999;83: 219–234.
- Laryngoscope 1991;101:245–9.
- Ann Otol Rhinol Laryngol 1992;101:185–8.
- Laryngoscope. 2004 Apr;114(4):789.
- Laryngoscope. 2001 Nov;111(11 Pt 1):1989-92.
- Diagn Cytopathol 1995;15:185–190.
- Arch Otolaryngol Head Neck Surg 1992;118:479–482.
- Cancer 1993;72:2306–2311.
- Head Neck. 1992 Nov-Dec;14(6):483-7.
- Acta Cytol. 1998 Jul-Aug;42(4):888-98.
- Acta Cytol. 1997 Sep-Oct;41(5):1412-20.
- Ear Nose Throat J. 2004 Feb;83(2):128-31.
- Diagn Cytopathol. 1998 Jul 1;19(1):44-50.
- Rev Laryngol Otol Rhinol (Bord). 2001;122(1):51-5.