Review of Parotid Biopsy Techniques

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Introduction and Background

- A lump in the head and neck region is one of the most common presentations
- 80% of salivary neoplasms arise in the parotid
- Ultrasound in the investigation of choice for parotid glands
- Fine Needle Aspiration Cytology (FNAC) gained popularity in the 1980s to diagnose parotid lesions.
- Surgical exploration carried the risk of infection, tumour seeding, facial nerve injury and fistula formation
- Ultrasound (US) is currently the investigation of choice when dealing with the parotid gland.
- Ultrasound Guided Core Needle Biopsy (USGCNB) has gained popularity in recent years. It is routinely used in liver and breast biopsies.

Objective

- Review different techniques of parotid biopsy
- To evaluate the efficacy of FNAC versus Ultrasound Guided Core Needle Biopsy (USGCNB)

Materials and Method

- Authors analysed data from key studies and established recommendations.
- Studies involved in the analysis were obtained from a literature search using pubmed, medline and embase.
- Key words used were 'parotid gland', 'biopsy', 'technique'.
- Authors supplemented search by input from experts in the field
- Exclusion criteria was determined.
- 12 studies were analysed

Results and Analysis

Advantages of USGCNB over FNAC

- ❑ Larger sample sizes – lower sample inadequacy allowing immunohistochemical analysis
- ❑ Higher sensitivity, specificity and accuracy (up to 98%, 100% and 96% respectively)
- ❑ FNAC has a higher rate of variability leading to inaccuracy of diagnosis
- ❑ Better in routine diagnosis (pleomorphic adenoma, Warthin's tumours and lymphoma)
- ❑ Lower rate of sample inadequacy
- ❑ USGCNB is better at diagnosing malignancy compared to FNAC

Advantages of FNAC over USGCNB

- FNAC reported as less painful by patients
- Potential seeding risk associated with USGCNB
- Lidocaine (or local anaesthetic) is used in USGCNB and this has a theoretical risk of increased morbidity

Discussion

- FNAC has difficulty diagnosing pleomorphic adenoma, basal cell adenoma and squamous cell carcinoma
- Injury to facial nerve can be avoided under ultrasound guidance

Conclusion

- We recommend USGCNB as a diagnostic tool
- Access to USGCNB and FNAC should determine the use, especially in smaller departments.

References

1. GUDMUNDSSON JK, AJAN A, ABTAHI J. The accuracy of fine-needle aspiration cytology for diagnosis of parotid gland masses: a clinicopathological study of 114 patients. J Appl Oral Sci [Internet]. 2016;24(6):561–7. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1678-77572016000600561&lng=en&tlng=en
2. Kesse KW, Manjaly G, Violaris N, Howlett DC. Ultrasound-guided biopsy in the evaluation of focal lesions and diffuse swelling of the parotid gland. Br J Oral Maxillofac Surg. 2002;40(5):384–8.
3. Douville N, Bradford C. Comparison of ultrasound-guided core biopsy versus fine-needle aspiration biopsy in the evaluation of salivary gland lesions. Head Neck. 2015;1657–61.
4. Burke C, Thomas R, Inglis C, Baldwin A, Ramesar K, Grace R, et al. Ultrasound-guided core biopsy in the diagnosis of lymphoma of the head and neck. A 9 year experience. Br J Radiol. 2011;84(1004):727–32.
5. Huang YC, Wu C Te, Lin G, Chuang WY, Yeow KM, Wan YL. Comparison of ultrasonographically guided fine-needle aspiration and core needle biopsy in the diagnosis of parotid masses. J Clin Ultrasound. 2012;40(4):189–94.
6. Pfeiffer J, Ridder GJ. Diagnostic value of ultrasound-guided core needle biopsy in patients with salivary gland masses. Int J Oral Maxillofac Surg. 2012;41(4):437–43.
7. Schmidt RL, Hall BJ, Wilson AR, Layfield LJ. A systematic review and meta-analysis of the diagnostic accuracy of fine-needle aspiration cytology for parotid gland lesions. Am J Clin Pathol. 2011;136(1):45–59.
8. Haldar S, Mandalia U, Skelton E, Chow V, Turner SS, Ramesar K, et al. Diagnostic investigation of parotid neoplasms: A 16-year experience of freehand fine needle aspiration cytology and ultrasound-guided core needle biopsy. Int J Oral Maxillofac Surg [Internet]. 2015;44(2):151–7. Versus Fine Needle Aspiration Cytology for Diagnosing Salivary Gland Tumors. J Pathol Transl Med [Internet]. 2015;49(2):136–43. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4367109&tool=pmcentrez&rendertype=abstract>