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Fine needle aspiration cytology of laryngeal lesions: an experience from tertiary cancer care center

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ABSTRACT

Background: Squamous Cell Carcinoma (SCC) comprises about 95% of laryngeal malignancies. Translaryngeal Fine Needle Aspiration Cytology (TLFNAC) of endolaryngeal and hypopharyngeal malignancies helps in early diagnosis. Although the diagnosis of a malignancy is often self-evident to a clinician, a tissue diagnosis is a must for starting treatment. TLFNAC helps the clinicians to plan the management at the earliest. Hence this study is to evaluate the utility of percutaneous translaryngeal FNAC in diagnosis of laryngeal lesions.
Methods: 189 Cases of Translaryngeal FNACs done during the period of Jan 2014 to Dec. 2015 were retrieved from the cytology register. FNAC was always done after Head and Neck radiology image studies. Usual FNA procedure was followed. FNA done with or without guidance and at times with clinician's assistance. Smears stained with MGG and Pap stain, and cytomorphological diagnosis was made.
Results: Out of 189 cases, aspirates were satisfactory in 146 cases and unsatisfactory in 43 cases. Of the 146 cases, 122 were SCC, pleomorphic adenoma one case, adenoid cystic carcinoma one case, 8 were uncategorized neoplasms and one case was granulomatous inflammation and remaining 14 cases had nonspecific findings.
Conclusions: TLFNA is simple, cost effective, less invasive and safe as compared to DL biopsy with less turnaround time for laryngo-pharyngeal lesions. This reduces the number of visits to OT and helps the clinicians in planning the treatment early like RT/CT or surgery. This avoids tracheostomy in borderline airway obstruction cases.

Keywords: FNAC, Neoplasms of larynx, Laryngoscopic biopsy

INTRODUCTION

Carcinoma larynx accounts for 1.6-2% of all cancers in men and 0.2- 0.4% in women. About 96% of the patients are males. Smoking is the main risk factor. Glottis is the most common site. Squamous cell carcinomas (SCC) constitute about 95% of all laryngeal malignancies. About 4-15% of SCC harbour Human Papilloma Virus (HPV), most common type is HPV-16.[1] Computerised Tomography (CT) and/or Magnetic Resonance Imaging (MRI) helps to further define the loco regional extent of the disease.[2]

The gold standard for diagnosis of endo- laryngeal lesion is laryngoscopic biopsy, under general anaesthesia (GA).[3] Biopsy procedure requires GA, additional cost and longer turnaround time to obtain the report that may delay the initiation of treatment. Lesions of the larynx may cause narrowing of airways depending on the size of the lesion. Biopsy (Bx) procedure may induce stridor in narrow

airways. Tracheostomy is mandatory for lesions with compromised airway.[4]

To avoid all these, well-established procedure FNA may be a good diagnostic modality, especially in lesions requiring non-surgical treatment, where avoiding tracheostomy is beneficial to the patient.

FNAC of laryngeal lesions is not in practice in most of the hospitals. Even though fine needle aspiration cytology (FNAC) is a well-established procedure, translaryngeal FNAC of endolaryngeal and hypo pharyngeal malignancies is yet to find popularity among head neck oncologists and pathologists alike. Although the diagnosis of a malignancy is often self-evident to a clinician, a tissue diagnosis is a must for starting treatment.

Traditional direct laryngoscopic punch biopsy necessitates a general anaesthesia and its attendant risks, possible difficult intubation, subsequent difficult extubation and emergency tracheostomy. Poor visualization of growth due to its submucosal and/or infiltrative nature or anterior commissure location may require repeat biopsy under repeat general anaesthesia.[5] The histopathology report is available after a minimum of 2-3 days, hence delaying initiation of treatment in case of inadequate specimen. Particularly patients who are not planned for a surgical treatment and who do not need direct laryngoscopic evaluation to assess for operability, undergo a procedure with the above risks, just to establish the diagnosis. The alternative option of exfoliative cytology has been documented in many old studies, also requires a general anaesthesia. All clinicians are familiar with internal head neck anatomy, and this knowledge can be translated into a simple procedure, called translaryngeal FNAC, which is safe, technically feasible, cost beneficial and has a high sensitivity and specificity especially when done under ultrasonography guidance.

In our centre Percutaneous Translaryngeal FNAC (PTLFNA) was initiated with the intent of reducing the complications associated with GA and biopsy procedure in obstructive airways. Aim of this study is to assess the utility of PTLFNA as a diagnostic modality for laryngeal lesions.

METHODS

All patients who underwent PTLFNA from Jan 2014 to December 2015 (2 years) in Kidwai Memorial Institute of Oncology, cytology division, department of pathology, which is a tertiary cancer care centre were included in this retrospective study. The clinical details were retrieved from the hospital medical record. All patients of laryngeal lesions who gave consent for FNA procedure were included and others were excluded.

The laryngeal lesions were initially assessed with CT scan/MRI prior to the FNA procedure. 21-23 G needle was used with or without FNA gun. With the assistance of CT scan and head and neck surgeon, the needle was gently pushed forward through the skin into the middle of the mass. Then the needle was thrusted to and fro for 4 – 5 times and material was smeared. Two to four smears were made for each case depending on the material aspirated. Smears were stained with MGG and PAP stains. Supraglottic lesions were approached through thyrohyoid membrane, glottic lesions through Thyroid cartilage notch, and subglottic lesions through cricothyroid membrane (Figure 1).[9] Ultrasonography (USG) guidance was used all most all cases, especially needed for the lesions located in pyriform sinus to avoid injury of carotid artery and jugular vein and in a few post-cricoid lesions. Repeat FNA was attempted for cases without significant cellular material. The data obtained by our study is analysed and tabulated.

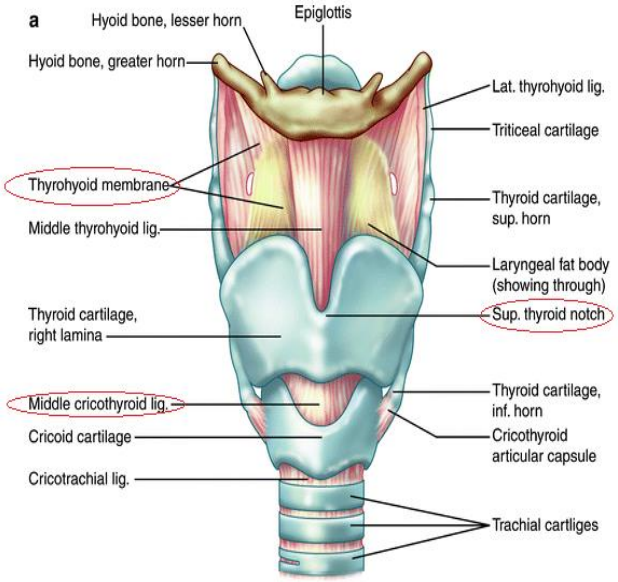

Figure 1: Diagram depicting the approach of anatomical laryngeal lesions.[9]

RESULTS

A total of 189 patients underwent percutaneous TLFNA in 2 years. The Aspirate material was satisfactory in 146 cases and unsatisfactory in 43 cases (including repeat FNAC). These 43 cases were assessed to know the cause of failure. It was noted that the lesions were too small, behind the cartilage, posterior lesions, non-cooperative anxious patient, etc. to add to this another reason being an inexperienced hands. Males were 175 and females were 14 (Table 1). Age ranged from 20 to 89years with peak occurrence was in the age group of 50 to 69 years (Table 2). In 146 cases a definitive cytomorphological diagnosis was made (Table 3). Among nonneoplastic category, 6 cases were inflammatory, in which two were granulomatous inflammation and remaining four were showing non-specific inflammation (Figure 2).

Table 1: Table showing the sex distribution of TLFNA.

Total no. of cases	Males	Females
189	175	14

Table 2: Table showing age distribution of TLFNA (N=189).

Age range (in years)	No. of cases
20-29	02
30-39	08
40-49	28
50-59	46
60-69	63
70-79	35
80-89	07

Table 3: Table showing the cytomorphologic diagnosis of TLFNA (N=189).

Cytomorphological diagnosis	No. of cases
Squamous cell carcinoma	122
Pleomorphic adenoma	01
Adenoid cystic carcinoma	01
Uncategorized	08
Descriptive	08
Non neoplastic	06
No significant cellular material	43

In neoplastic category, 122 cases were SCC, in which all grades were seen, like well differentiated SCC to poorly differentiated SCC (Figure 3). 2 cases were salivary gland neoplasms, Pleomorphic adenoma (PA) and Adenoid cystic carcinoma (AdCC) one each (Figure 4). 8 cases were malignant but could not be categorized, labelled as poorly differentiated carcinoma, possibly high grade Squamous cell carcinoma. 8 cases were given descriptive report like necrosis, mucinous material, fibroblasts etc. in spite of repeated aspirate. And 43 cases showed inadequate/no significant cellular material. In latter two groups biopsy was suggested. As such no complications were observed except mild haemoptysis in few cases. Follow-up of these cases revealed, out of 122 cases of SCC, 78 cases were treated with radiotherapy (RT) and chemotherapy, 27 cases underwent surgery and 17 cases lost for follow-up (Table 4). One case of pleomorphic adenoma underwent surgery and Adenoid cystic carcinoma patient died within 2 months without opting for any treatment. Among the 8 cases of poorly differentiated carcinoma, two were confirmed as SCC by biopsy were given RT, three patients died and remaining lost for follow-up. In 8 cases of descriptive report, two were confirmed as SCC and 6 cases lost for follow-up. Among the 43 cases of unsatisfactory, 13 cases were diagnosed as SCC on biopsy and took further treatment and remaining cases lost for follow-up.

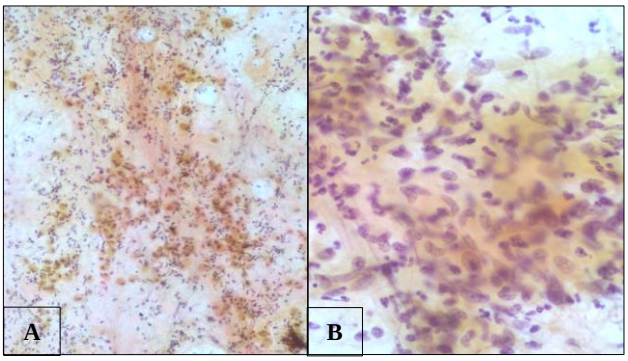

Figure 2: Photomicrograph of granulomatous inflammation: PAP stain [A-10X and B-20X].

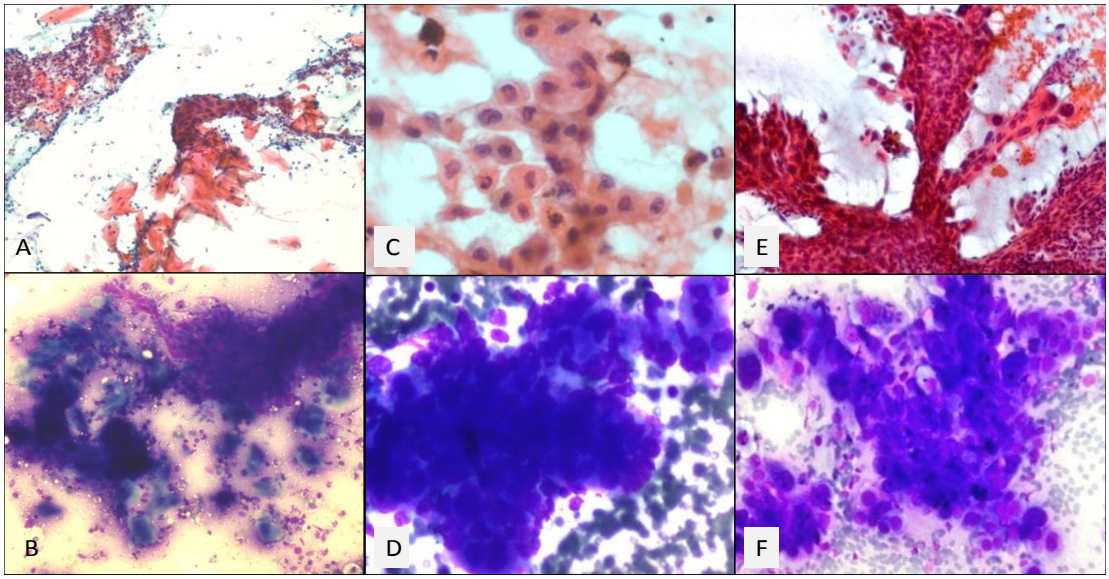

Figure 3: Photomicrograph of cytomorphology of SCC. Well differentiated SCC (A-PAP and B-MGG): Moderately differentiated SCC(C-PAP and D-MGG); poorly differentiated SCC (E-PAP and F-MGG).

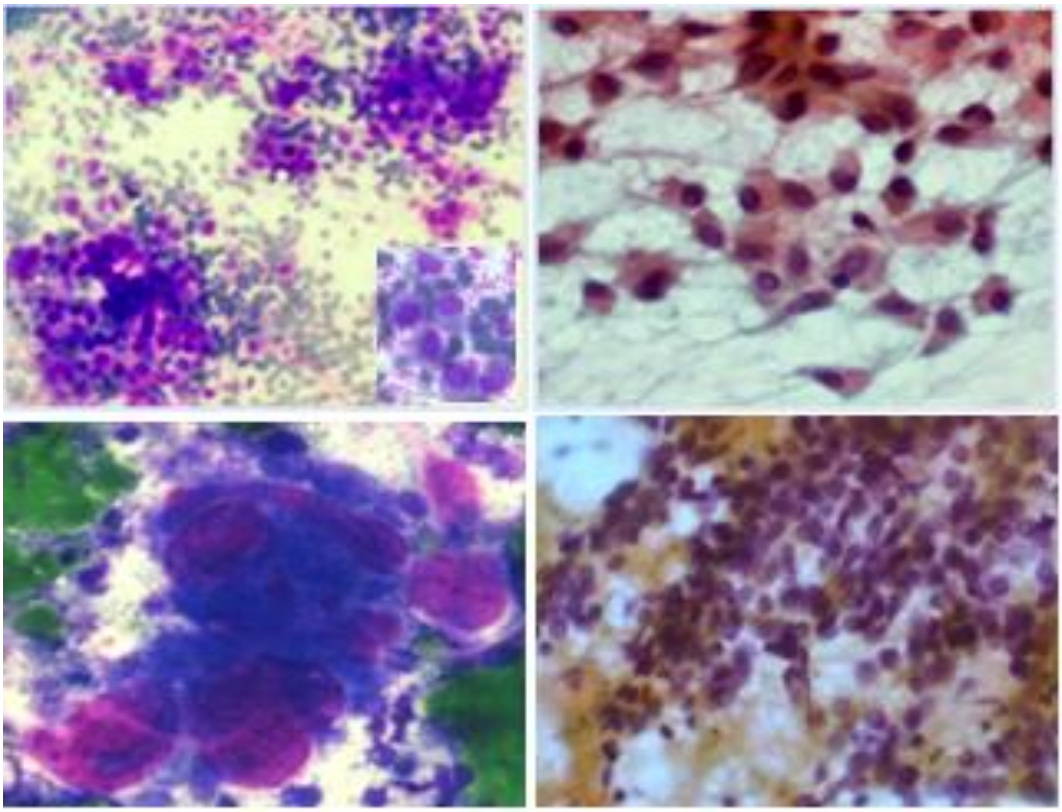

Figure 4: Photomicrograph of pleomorphic adenoma (A-MGG and B-PAP) and adenoid cystic carcinoma (C-MGG and D-PAP).

Table 4: Follow up of the patients.

Cytolo. Diag.	No.	RT+CT	Surgery	Follow up(FU)
SCC	122	075	24	23-lost for FU
PA	001	---	Yes	Doing well
ACC	001	---	---	Died <2 months
Uncategorized	008	2Bx-SCC	---	1 lost FU, 1 died 3-died, 3-lost FU
Descriptive	008	---	2 Bx SCC	6-lost FU
No cellular material	043	2Bx-SCC	5 Bx SCC	36-lost FU
Non Neoplastic	008	---	---	2-Kochs, 6-lost FU

DISCUSSION

FNAC is the method of choice for the initial investigation of many palpable head and neck masses.[1-3] Traditional direct laryngoscopic (DL) punch biopsy necessitates a general anaesthesia and its attendant risks, possible difficult intubation, subsequent difficult extubation and emergency tracheostomy. Poor visualization of growth due to its submucosal and/or infiltrative nature or anterior commissure location may require repeat biopsy under repeat general anaesthesia. Particularly patients who are not planned for a surgical treatment and who do not need direct laryngoscopic evaluation to assess for operability, just to establish the diagnosis, TLFNA is the right choice for the diagnosis of the laryngeal lesions. All clinicians are familiar with internal head neck anatomy, and this knowledge can be translated into a simple procedure, TLFNA. This is a safe, technically feasible, cost beneficial, easier to repeat in case of unsatisfactory aspirates and less turn over time to obtain a diagnosis. This also requires experienced hands in FNA technique.

The main prerequisite for TLFNA is a recent CECT scan of the neck with 2 mm cuts at the glottis or an MRI of the neck, to localize the tumour accurately. TLFNA can yield similar results as with FNAC of other sites when assessed with clinical and radiological findings in experienced hands. Studies on TLFNA are limited.

Only one study was found in the literature search. Citardi et al has done CT guided FNAC of three suspected recurrent laryngeal SCC, post EBRT.[6]

Parasuraman et al studied 10 cases of FNAC versus direct laryngoscopic biopsy in suspicious laryngo-pharyngeal masses.[7] In eight cases a definitive FNA diagnosis of SCC was made which was concordant with the biopsy report. Two cases were inconclusive in the form of atypical cells and inadequate sample, which were confirmed by biopsy.

Kusunoki et al performed only fine needle aspiration in case of a laryngeal cyst rather than aggressive surgery for extirpation of the cyst using an external approach, in a 57 y/M patient of advanced renal cell carcinoma with multiple metastases of both lung and bone.[8] This fine needle aspiration could improve the quality of life by decreasing both the laryngeal swelling and pain.

To say about TLFNA vs. biopsy, the number of visits to OT is less in TLFNA as compared to DL biopsy with or without tracheostomy, before surgery. Less turn-around time (TAT) helps the clinician to plan the therapy at the earliest. FNA TAT being less than a day versus biopsy-histopathology TAT being 2-3 days. The cost of TLFNA is less as compared to DL Bx and tracheostomy. TLFNA avoids tracheostomy in turn voice preservation is feasible and avoidance of RT induced changes at tracheostomy site. TLFNA is a greatly under-rated procedure. It deserves to be promoted as a primary diagnostic tool, as is the case for other masses of head and neck.

CONCLUSION

Translaryngeal FNAC is a greatly underrated procedure. It deserves to be promoted as a primary diagnostic tool, as is the case for other masses of head and neck. TL FNAC can be an effective alternate diagnostic modality for laryngeal lesions. It reduces the turnaround time in diagnosis. Radiological study is a must prior to the FNA. This helps the clinicians in early planning the management of the disease especially for bulky lesions where alternate radiotherapy/chemotherapy is treatment of choice.

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Ethical approval: Not required

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