



## “ROLE OF FNAC IN THE DIAGNOSIS OF SALIVARY GLAND LESION”

### Pathology

**Dr. Rifat Qureishi\*** Associate Professor, Department of Pathology, Shyam Shah Medical College, Rewa (M.P.). \*Corresponding Author

**Dr. M.H. Usmani** Professor, Department of Medicine, Shyam Shah Medical College, Rewa (M.P.).

**Dr. U.R. Singh** Professor & Head, Department of Pathology, Shyam Shah Medical College, Rewa (M.P.).

**Dr. P.C. Kol** Professor, Department of Pathology, Shyam Shah Medical College, Rewa (M.P.).

### ABSTRACT

**Background:** Fine needle aspiration cytology (FNAC) has been used for diagnosis of salivary gland lesions for many years. Various studies in the existing literature have shown a wide range of sensitivity and diagnostic accuracy of cytologic diagnosis. FNAC is a safe, simple, cost effective, accurate and minimal invasive procedure for the evaluation of salivary gland lesions.<sup>1-4</sup> FNAC is not only useful in planning definitive preoperative diagnosis but also can prevent unnecessary surgical intervention.<sup>2,5-6</sup> Salivary gland swelling occur more commonly in 3rd decade of life with equal sex incidence. Parotid is one of the most commonly involved glands in the head & neck region swellings. FNAC appears to be highly sensitive for benign tumours and highly specific for malignant tumors and it should be the first line of investigation in evaluating the salivary gland pathologies. Early diagnosis and appropriate management carries good prognosis.<sup>7</sup> **Methods:** Patients with suspected salivary gland enlargements, referred for FNAC, were included in this study. FNAC was performed by using the standard procedure. Cytologic diagnosis was compared with histopathologic diagnosis wherever it was available. **Results:** In the present study conducted in the department of pathology, Shyam Shah Medical College Rewa MP, over a period of 5 years, 152 Patients with suspected salivary gland enlargements were retrospectively appraised. The benign lesions of salivary gland were 133 (87.5%), out of which Pleomorphic adenoma was diagnosed in 75 (56.39%) cases, clinical correlation was found in 58 (77.33%) cases. 29 cases were subsequently correlated with histopathological examination 26 correctly correlated and the diagnostic accuracy of FNAC was found to be 89.65%. Inflammatory lesions were proved correct in 08 out of 10 cases after histopathology. Therefore, accuracy of FNAC was 80.0%. Malignant lesions of salivary gland were found in 19 cases, out of which 15 (78.94%) cases correlated with clinical diagnosis. 13 cases were subjected to histopathology 10 correctly correlated and the diagnostic accuracy of FNAC was found to be 76.92%. Overall diagnostic accuracy of FNAC was 84.61%. **Conclusion:** In conclusions it can be established that FNAC is an efficient and accurate procedure with high sensitivity index, and its usefulness is enhanced due to it being a relatively easy procedure which can be carried out even on outdoor patients.

### KEYWORDS

FNAC, Salivary Gland, Cytology and Histopathology

### INTRODUCTION-

Fine needle aspiration cytology (FNAC) is a cytodagnostic method based on morphologic findings of individual and small group of cells aspirated using a fine needle. FNAC was introduced in 1920's and soon it gained wide acceptance among clinicians due to ease of its performance and rapidity of diagnosis. Currently, FNAC has become a cornerstone diagnostic screening tool in head and neck swellings.

The role of FNAC in suspected salivary gland swellings is two folds. Firstly, to confirm the origin as preauricular and submandibular lymph node swellings can mimic salivary gland neoplasm clinically and secondly to get a preliminary diagnosis about the nature of the disease process before embarking upon a definite management plan. FNAC is a reliable method to differentiate between inflammatory and neoplastic lesions.

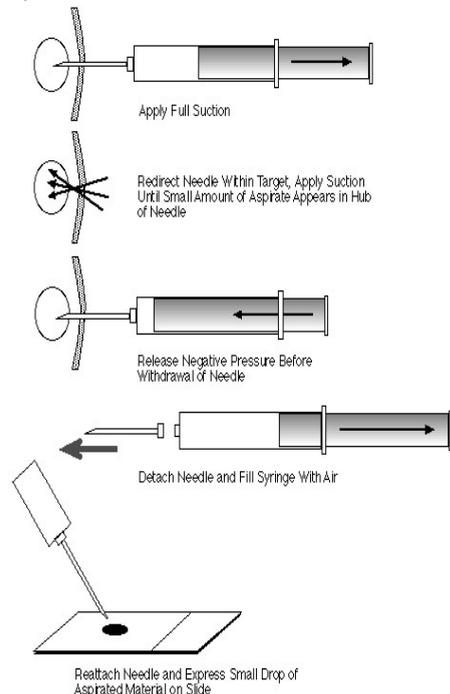
FNAC poses a negligible risk of complications in medical centers where the technique is routinely used. Owing to FNAC, approximately a third of all patients with salivary gland lesions are spared surgery.<sup>8</sup> In patients undergoing radical surgery preoperative FNA enables the clinician to estimate the urgency and devise the surgical approach including, in some case of parotid, the decision to preserve or sacrifice the facial nerve. A preoperative diagnosis also allows proper patient counseling.<sup>9</sup>

In the practice of FNAC, there are clear advantages to patients, doctors and to the hospital. The technique is relatively painless, rapid and inexpensive. Its accuracy in many situations, when applied by experienced and well-trained practitioners, matches that of histopathology in providing an unequivocal diagnosis.

**OBJECTIVES-** Role of FNAC in diagnosis of salivary gland lesions (a retrospective study).

**METHODS-** The present study was conducted in the Department of Pathology, S.S. Medical College and Associated G.M. & S.G.M. Hospitals, Rewa (M.P.). The study design was Retrospective and spanned the duration from 1st Jan 2015 to 31st Dec. 2019. 152 patients included were those referred to the Department of Pathology for FNAC from the OPD or wards of the hospital who presented with

salivary gland swelling. Samples of salivary glands FNAC were also correlated with clinical findings and HPE or biopsy, when available and/or indicated. Samples for cytological details were stained with Hematoxyline–Eosin and/or Geimsa and those for histopathology, by Hematoxyline and Eosin stains.



**RESULTS-** A total of 152 cytological cases were evaluated out of which 114 cases correlated with clinical diagnosis and out of 52 HPE done in salivary glands samples 44 correlated correctly. The results were presented as follow:-

**Table No. 1: Cytological, Clinical and Histopathological Correlation of Lesions of Salivary Gland**

Diagnoses		No. of Cases	Clinically Correlated Cytologically Diagnosed Cases	Histologically Confirmed Cases	Cases Diagnosed by FNAC (correlated with Histological Diagnosis)	FNAC Diagnostic Accuracy (%)
Benign N=133	Pleomorphic adenoma	75	58 (77.33%)	29	26	89.65
	Inflammatory lesions	58	41 (70.68%)	10	8	80.0
Malignant N=19	Malignant Lesions	19	15 (78.94%)	13	10	76.92
<b>Total</b>		<b>152</b>	<b>114</b>	<b>52</b>	<b>44</b>	<b>v</b>

The above table shows that total number of benign lesions of salivary gland was 133 (87.5%), out of which Pleomorphic adenoma was diagnosed in 75 cases, clinical correlation was found in 58 cases (77.33%). 26 (out of 29 HPE samples) cases were subsequently correlated with histopathological examination and the diagnostic accuracy of FNAC was found to be 89.65%. Inflammatory lesions were proved correct in 08 out of 10 cases after histopathology. Therefore, the accuracy of FNAC was 80.0%. Malignant lesions of salivary gland were found in 19 (12.5%) cases, out of which 15 (78.94%) cases correlated with clinical diagnosis. 13 cases were subjected to histopathology 10 correlated correctly and the diagnostic accuracy of FNAC was found to be 76.92%. Overall diagnostic accuracy of FNAC was 84.61%. There were no false positive results. False negative results were seen in 8 cases leading to overall sensitivity and specificity of 86.6% and 100% respectively. In cases of benign lesions, the sensitivity was 88.6% and that for malignant lesions was 81.25%.

### DISCUSSION-

The present study was designed to assess the accuracy of cytological examination of the cases requisitioned for aspiration cytology of salivary gland. A total of 152 cytologies were evaluated, of which 114 (75.0%) cases correctly correlated with the clinical diagnosis. Histopathological examination were available for correlation in 52 cases, of which 44 (84.6%) correlated correctly.

Findings of the present study are in concordance to those reported by various other authors. Accuracy of cytodiagnosis in the present study compared with various studies is shown in the ensuing table (Table 2).

**Table-2**

S NO.	Study	Sensitivity	Specificity	Accuracy of Cytodiagnosis (%)
1	Naem Sultan Ali et al <sup>9</sup> (2011)	84.0%	98.0%	94.0%
2	Esther Diana Rossi et al <sup>10</sup> (2016)	-	97.6%	91.3%
3	Archana Shetty et al <sup>11</sup> (2016)	94.4%	100%	97.6%
4	Basim M. Al-Khafaji et al <sup>12</sup> (1998)	82.0%	86.0%	84.0%
5	Samreen Naz et al <sup>13</sup> (2015)	77.7%	86.3%	83.8%
6	Stewart et al <sup>14</sup> (1999)	92.0%	100%	98.0%
7	Michael Lurie et al <sup>15</sup> (2002)	66.0%	100%	69.2%
8	Paik I et al <sup>16</sup> (1999)	89.7%	96.3%	70.0%
9	Ashraf et al <sup>17</sup> (2010)	B-98.5% M-77.7%	B-87.05% M-98.7%	-
10	Canan Ersoz et al <sup>18</sup> (2004)	94.0%	100%	-
11	Das DK et al <sup>19</sup> (2004)	94.6%	75.0%	91.1%
12	Henry et al <sup>20</sup> (2015)	B-95.4% M-75.0%	B-100% M-97.5%	-
13	Mallon DH et al <sup>21</sup> (2013)	B-85.0% M-52.0%	B-76.0% M-92.0%	-
14	Present Study (2019)	86.6% B-88.6% M-81.25%	100%	84.61%

B= Benign ; M= Malignant

Findings of the present study are also in conformity with the findings of other authors. Naem Sultan Ali et al<sup>9</sup>, reported a concordance with histological results in 86%. Specificity was 98%, sensitivity was 84%, and diagnostic accuracy was 94%. Esther Diana Rossi et al<sup>10</sup> reported an overall specificity of 97.6% and diagnostic accuracy of 91.3%. Archana Shetty et al<sup>11</sup> observed an accuracy of 97.6%. Basim M.

Al-Khafaji et al<sup>12</sup> found a sensitivity of 82%, and specificity of 86% with a cytodiagnostic accuracy of 84.0%. Samreen Naz et al<sup>13</sup> found the overall accuracy of FNAC to be 83.8% with 77.7% sensitivity and 86.3% specificity. Stewart et al<sup>14</sup> also observed the overall sensitivity, specificity, and accuracy of 92%, 100%, and 98%, respectively. Michael Lurie et al<sup>15</sup> found no false positive FNA reports. The calculated sensitivity, specificity and accuracy of FNA diagnosis in their study were 66%, 100%, and 69.2% respectively. Paik I et al<sup>16</sup> showed that the specificity was 96.3%, sensitivity was 89.7%, and diagnostic accuracy was 70.0%. Ashraf et al<sup>17</sup> also found a sensitivity of benign lesion to be 98.5% and that for malignant lesions as 77.7%, Canan Ersoz et al<sup>18</sup> observed that the overall sensitivity, specificity, were 94%, and 100%, respectively. Das DK et al<sup>19</sup> reported the sensitivity, specificity, and accuracy of 94.6%, 75.0%, and 91.1% respectively. Henry et al<sup>20</sup> observed a sensitivity of FNAC for benign and malignant lesion to be 95.4% and 75.0% respectively, and specificity for benign and malignant lesions to be 100% and 97.5% respectively. Mallon DH et al<sup>21</sup> have found the sensitivity for benign and malignant lesion to be 85.0% and 52.0% ; specificity for benign and malignant lesions to be 76.0% and 92.0% respectively.

FNA cytology thus provides accurate diagnosis of most salivary gland lesions and contributes to conservative management in many patients with nonneoplastic conditions.

### Correlation of Accuracy

The total number of benign lesions of salivary gland which were clinically correlated and cytologically diagnosed was 114, out of which Pleomorphic adenoma was diagnosed in 75 cases, clinical correlation was found in 58 cases (77.33%). 29 cases were subsequently correlated with histopathological examination and the diagnostic accuracy of FNAC was found to be 89.65%. Inflammatory lesions were proved correct in 8 out of 10 cases after histopathology. Diagnostic accuracy of FNAC was found to be 80.0%.

Malignant lesions of salivary gland were found in 19 cases, out of which 15 (78.94%) cases correlated with clinical diagnosis. 13 cases were subjected to histopathology and the diagnostic accuracy of FNAC was found to be 76.92%. Overall diagnostic accuracy of FNAC was 84.61%.

Qizilbash AH et al<sup>8</sup>, performed fine needle aspiration biopsy of the minor salivary glands on 160 patients and cytologic diagnosis was correlated with clinical follow-up and histologic findings. They observed that 122 (76.3%) lesions were benign, including 47 tumours; there were 24 (15%) malignant lesions, 10 of which were primary and 14 metastatic. Overall accuracy was 98% and sensitivity of the technique was 87.5%.

The fact which is obvious from the observations of the present study is that cytology can achieve a diagnostic accuracy as high as 84.61% which is in agreement with various earlier studies reported by different authors as is evident from the data presented. It is clear from the given account that in the practice of FNAC, there are clear advantages to patients, doctors and to the hospital. The technique is relatively painless, produces a speedy result and is relatively inexpensive. Its accuracy in many situations, when applied by experienced and well trained practitioners, matches that of histopathology in providing an unequivocal diagnosis. Maximum incidence of salivary gland lesions was observed in 3rd decade of life followed by 5th and 6th decade. The results are in concordance to study done by Ashraf et al<sup>17</sup>. The specificity of FNAC in detecting benign tumors was in conformity to earlier studies.<sup>11,14,15,18,20</sup>

In the present study, FNAC was found to be highly sensitive and specific for the diagnosis of salivary gland lesions.

FNAC should be first choice of investigation in evaluating the salivary gland pathologies. History and physical examination complement

FNAC and help in diagnosis. FNAC is an accurate, simple, rapid, inexpensive investigation and well tolerated by the patient. Hence, the appropriate therapeutic management could be planned earlier, whether it is, conservative for non-neoplastic lesions, surgery for tumours and radiotherapy and/or chemotherapy for metastasis.

The histopathological study of salivary gland neoplasms is complex and diverse. Histopathological examination is the gold standard method of diagnosis, predicting prognosis by typing, staging and grading in case of malignant neoplasms of salivary gland.

Diagnosis of the salivary gland tumors must be considered in any patient presenting with salivary gland swelling. Accurate diagnosis is essential as salivary gland neoplasms have diverse clinical and prognostic outcomes.

Since most malignant tumors are asymptomatic, and long standing benign tumors can undergo malignant change, community awareness and early referral is necessary, as prognosis is good if treated early.

#### CONCLUSION-

In conclusions it can be well established that FNAC is an extremely efficient and accurate procedure with high sensitivity index, and its usefulness is enhanced due to it being a relatively easy procedure which can be carried out even on outdoor patients. The observations revealed are encouraging especially due to the fact that many patients are spared of the tedious & dangerous procedure of excision biopsy just because reasonably accurate and quick diagnosis is safely made by Fine Needle Aspiration Cytology.

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