

FREQUENCY OF METASTATIC SQUAMOUS CELL CARCINOMA IN CERVICAL LYMPH NODES IN PATIENTS PRESENTING WITH ORAL SQUAMOUS CELL CARCINOMA

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Abstract

Objective: To determine the frequency of FNAC (Fine needle aspiration cytology) findings in cervical lymph nodes of patients presenting with squamous cell carcinoma of the oral cavity in our setup.

Materials & Methods: This Cross-sectional descriptive study was done in Advanced FNAC clinic, Peshawar, from January 2017 to March 2018 (1 year, three months). Non-probability purposive sampling was done. A total of 54 diagnosed cases of oral squamous cell carcinoma presenting with cervical lymphadenopathy were included in the study. Patients in whom lymphadenopathy was due to infection and tuberculosis were excluded from the study. FNAC samples were obtained from the cervical lymph nodes of patients; slides were prepared and examined. The results were drawn accordingly. Mean, and the standard deviation was calculated for quantitative variables, e.g. age. Frequencies and percentages were calculated for qualitative variables like diagnosis and gender. Data were analyzed using SPSS -18.

Results: A total of 54 cases diagnosed as Squamous cell carcinoma of the oral cavity in Khyber college of dentistry were referred for cervical lymph node FNAC. Age of study sample ranged from 40 to 60 years, with a mean of 54 ± 12 SD. There were 49 (90%) male and 5 (10%) female cases. Cervical lymph node FNAC findings showed that about 14 (26%) cases had a large number of immunoblasts with no atypical cells, suggestive of reactive lymphoid hyperplasia. While 40 (74%) cases had dimorphic squamoid cells with hyperchromatic nuclei and high nuclear to cytoplasmic ratio with lymphoid aggregates, suggestive of metastatic squamous cell carcinoma.

Conclusion: This study showed that the frequency of metastatic squamous cell carcinoma in cervical lymph nodes was very high in patients with squamous cell carcinoma of the oral cavity as compared to reactive hyperplasia. FNAC is diagnostically important and minimally invasive technique that can be used in the workup of patients presenting with cervical lymphadenopathy.

Key Words: Fine needle aspiration cytology, lymph nodes, squamous cell carcinoma, reactive hyperplasia

Introduction

Squamous cell carcinoma of the oral cavity is one of the most common malignant tumours of the head and neck area^{1,2,3}. It constitutes about 80-95% of oral cavity malignancies^{1,3,4}. It is common because most of its risk factors affect the most superficial

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layers of the mucosa and gingiva, thus predisposing to squamous cell carcinoma⁵. It commonly spreads to the lymph nodes of the cervical region^{1,4}. The presence or absence of spread of squamous cell carcinoma to the cervical lymph nodes determines the prognosis in the patients^{5,6,7}. The presence of nodal metastasis is associated with poor outcome in patients with squamous cell carcinoma of the oral cavity^{7,8,9,10}. Unilateral cervical metastasis decreases the survival rate by 50 %, while bilateral cervical metastasis decreases survival rate by further 25%^{5,11,12}. Sometimes, the metastasis remains occult and undetected for a long time, which causes a further decline in survival rate and thus, poor prognosis¹³. Therefore, early detection of nodal metastasis is important.

About 500,000 new cases of head and neck cancers are diagnosed every year globally³. Out of which, about 363,000 cases are of oral squamous cell carcinoma^{3,5}. Squamous cell carcinoma of the oral cavity leads to almost about 200,000 deaths annually worldwide^{3,5}. Metastasis to cervical lymph nodes occur in about 80% of patients of oral squamous cell carcinoma^{25,26}.

There are various investigation tools for the detection of metastasis in lymph nodes in cases with oral squamous cell carcinoma^{7,14,15}. The investigation tools include ultrasound scan, computed tomography scan, magnetic resonance imaging, positron emission tomography and fine needle aspiration cytology (FNAC)^{5,7,12,14,16,17}. The earlier the metastasis is detected, the better the outcome¹⁸. The cytological examination of lymph nodes is a simple, cost-effective and quick procedure to provide information about the metastasis to the lymph nodes¹⁹. Cytological examination of the lymph node is done by fine-needle aspiration cytology (FNAC).

FNAC is a simple and reliable method for detecting metastasis to the lymph nodes^{18,19}. It is a relatively painless and minimally invasive procedure^{19,20,21}. Its accuracy can approach that of histopathology in providing a definite diagnosis in many cases¹⁹. It can be done on an outpatient basis and also prevents unnecessary surgery¹⁸. Therefore, it is now the first-line investigation technique for workup of enlarged lymph nodes^{13,18,19}.

The present study was done to determine the frequency of metastatic squamous cell carcinoma

in cervical lymph nodes in patients of squamous cell carcinoma of the oral cavity in our setup, thus highlighting the diagnostic importance of FNAC.

Materials and Methods

This Cross-sectional descriptive study was done in Advanced FNAC clinic, Peshawar, from January 2017 to March 2018. A total of 54 diagnosed cases of squamous cell carcinoma presenting with cervical lymphadenopathy referred from Khyber College of Dentistry, Peshawar, were included in the study. Patients in whom lymphadenopathy was due to infection and tuberculosis were excluded from the study. FNAC samples were obtained from cervical lymph nodes of patients; slides were prepared and examined under a microscope by a histopathologist. The results were drawn accordingly. Mean, and the standard deviation was calculated for quantitative variables e.g. age. Frequencies and percentages were calculated for qualitative variables like diagnosis and gender. Data were analyzed using SPSS version 18.

Results

A total of 54 cases diagnosed as Squamous cell carcinoma oral cavity were referred for cervical lymph node FNAC. Age of study sample ranged from 40 to 60 years, with a mean of 54 ± 12 SD. There were 49 (90%) males and 5 (10%) female cases. Male to female ratio was 9.8: 1. Cervical lymph node FNAC findings of 54 patients are shown in table 1.

Discussion

In the present study, it was found that the age range of the study population was 40 – 60 years. It is a proven fact that squamous cell carcinoma of oral cavity occurs in sixth to seventh decade of life¹. The present study showed that about 90% of the cases were males while 10% of cases were females. Male to female ratio was 8.1:1. Similar male predominance was reported by Mehdi G et al., showing a male to female ratio of 3.1:1¹⁹. Similar high male to female ratio was reported in other studies as well^{1,15,18,22,23}. The higher incidence in males in the present study

Table 1: Cervical lymph node FNAC findings of 54 patients of squamous cell carcinoma oral cavity

FNAC diagnosis	n (%)
Metastatic squamous cell carcinoma	40 (74%)
Reactive lymphoid hyperplasia	14(26%)

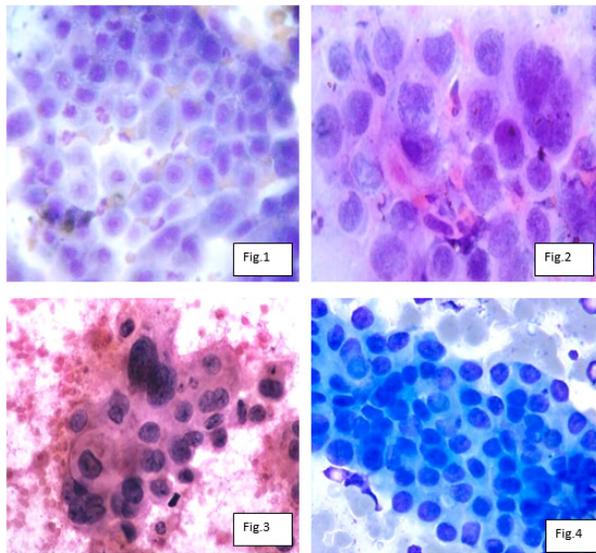


Figure 1-4: Photomicrographs of metastatic squamous cell carcinoma in cervical lymph node, showing dysmorphic squamoid cells with hyperchromatic nuclei, high nuclear to cytoplasmic ratio, and lymphoid cell aggregates on cytological smears, (Hemotoxylin-eosin stain in fig.3, and quick diff stain in fig.1,2,4, x1000)

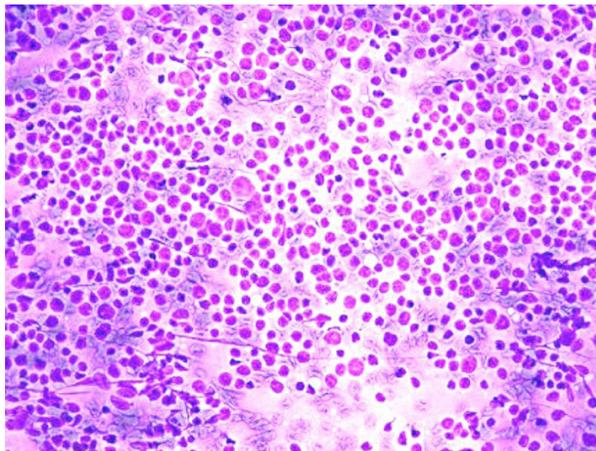


Figure 5: Photomicrograph of reactive lymphoid hyperplasia, showing a large number of immunoblasts, and no atypical cells on cytological smears. (Hemotoxylin-eosin stain, x1000)

is due to high incidence of smoking and regular snuffing in males as compared to females. Smoking is a known carcinogen¹⁹. It is a known risk factor for oral squamous cell carcinoma²⁴.

The present study showed about 40 (74%) cases of oral squamous cell carcinoma had metastatic infiltration on cytological smears. This value is consistent with that reported in literature i.e 80%-85%^{25,26}. The cases of metastatic infiltration showed dysmorphic

squamoid cells with hyperchromatic nuclei, high nuclear to cytoplasmic ratio, with lymphoid cell aggregates on cytological smears (Figure:1,2,3,4). The remaining 14 (26%) cases were diagnosed as reactive hyperplasia by cytological examination. These cases showed lymphoid aspirate with a large number of immunoblasts, and no atypical cells on cytological smears (Figure.5). So in the present study, metastatic disease was common, and FNAC successfully detected infiltration in the lymph nodes. These findings are consistent with those in other studies^{17,27,28}.

In a study done by Geetha, about 67% of cases of oral squamous cell carcinoma had metastatic infiltration in the lymph nodes as diagnosed through FNAC⁵. This data is somewhat similar to the present study. Their study concluded that FNAC was a reliable diagnostic tool to detect metastasis in lymph nodes in patients with squamous cell carcinoma of the oral cavity⁵. In another study done by Azam et al., FNAC was used as a tool to assess cervical lymph nodes in oral squamous cell carcinoma patients, and it was found that out of 37 cases, about 25 (67.6%) patients had metastatic disease in lymph nodes¹⁷. The incidence reported by that study is somewhat close to the one reported in the present study. Azam et al. also reported FNAC to be a helpful and accurate technique to assess nodal metastasis in oral carcinomas¹⁷. However, Khuraijam reported the incidence of metastatic squamous cell carcinoma in lymph nodes of about 36%, which is quite lower than that reported in the present study¹⁸. In another study, metastatic squamous cell carcinoma was reported in 45% of cases²⁹. Konar K reported the incidence of 14.7%, which is quite low as compared to the present study¹³. All of these studies reported FNAC to be diagnostically significant to detect nodal metastasis^{13,18,29}. Dabirmogadham and Konar K also suggested in their study that FNAC is a reliable technique to workup the metastatic lymph nodes^{13,30}.

The present study showed that the frequency of metastatic involvement of lymph nodes in cases of squamous cell carcinoma was the same as reported in the literature. It was through FNAC that malignancy was detected in the lymph nodes in the present study. It is a proven fact that detection of malignancy in lymph nodes through FNAC is reliable^{11,13,19,30}.

Conclusion

This study showed that the frequency of metastatic squamous cell carcinoma in cervical lymph nodes was very high in patients with squamous cell carcinoma of the oral cavity as compared to reactive hyperplasia. This finding is quite consistent with that reported in the literature. FNAC is a reliable investigation and should be considered for detecting metastatic lesions in lymph nodes.

References

1. Shakeel MK, Daniel MJ, Srinivasan SV, Koliyan R, and Kumar JV. Comparative analysis of detecting cervical lymph node metastasis with fine needle aspiration cytology. *J Nat Sci Biol Med.* 2015; 6 (1): 7–9.
2. Wang B, Zhang S, Yue K, Wang XD. The recurrence and survival of oral squamous cell carcinoma: A report of 275 cases. *Chin J Cancer.* 2013;32:614–8.
3. Kapoor C, Vaidya S, Wadhwan V, Malik S. Lymph node metastasis: A bearing on prognosis in squamous cell carcinoma. *Indian J Cancer* 2015;52:417-24.
4. Norling R, Buron BM, Therkildsen MH, Henriksen BM, Buchwald C, Nielsen MB. Staging of Cervical Lymph Nodes in Oral Squamous Cell Carcinoma: Adding Ultrasound in Clinically Lymph Node Negative Patients May Improve Diagnostic Work-Up. *PLoS One.* 2014; 9(3): e90360. doi:10.1371/journal.pone.0090360
5. Geetha NT, Hallur N, Goudar G, Sikkerimath BC, Gudis S. Cervical lymph node metastasis in oral squamous carcinoma preoperative assessment and histopathology after neck dissection. *J Maxillofac Oral Surg.* 2010; 9(1): 42–7.
6. Wensing BM, Merckx MA, Wilde PC, Marres HA, Hooogen FJ. Assessment of preoperative ultrasonography of the neck and elective neck dissection in patients with oral squamous cell carcinoma. *Oral Oncol* 2010;46:87-91.
7. Kallalli BN, Rawson K, Kumari V, Patil S, Singh A, Sulaga S. Comparison between clinical examination, ultrasonography, and computed tomography in the assessment of cervical lymph node metastasis in oral squamous cell carcinoma. *J Indian Acad Oral Med Radiol.* 2016;28:364-9.
8. Cohen JM, Wenig BM. General principles of head and neck pathology. In: Harrison LB, Sessions RB, Hong WK, editors. *Head and Neck Cancer: A Multidisciplinary Approach.* 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2009. 3–50.
9. Saafan ME, Elguindy AS, Abdel-Aziz MF, Younes AA, Albirmawy OA, Mandour M, et al. Assessment of cervical lymph nodes in squamous cell carcinoma of the head and neck. *Surg Curr Res.* 2013;3:145.
10. Hoang JK, Vanka J, Ludwig BJ, Glastonbury CM. Evaluation of cervical lymph nodes in head and neck cancer with CT and MRI: Tips, traps, and a systematic approach. *Am J Roentgenol* 2013;200:17-25.
11. Haberal I., Celik H., Goçmen H., Akmansu H., Yoruk M., Ozeri C. Which is important in the evaluation of metastatic lymph nodes in head and neck cancer: Palpation, Ultrasonography or computed tomography? *Otolaryngol Head Neck Surg.* 2004;130(2):197–201.
12. Shetty D, Jayade BV, Joshi SK, Gopalkrishnan K. Accuracy of palpation, ultrasonography, and computed tomography in the evaluation of metastatic cervical lymph nodes in head and neck cancer. *Indian J Dent.* 2015; 6(3): 121–4.
13. Konar K, Ghosh S, Ghosh T, Bhattacharya S, Sanyal S. Pitfalls in the cytodiagnosis of metastatic squamous cell carcinoma in the head and neck: A retrospective study. *J Cytol* 2008;25:119-22.
14. Liao LJ, Lo WC, Hsu WL, Wang CT, Lai MS. Detection of cervical lymph node metastasis in head and neck cancer patients with clinically N0 neck- a meta-analysis comparing different imaging modalities. *BMC Cancer* 2012;12:23-6
15. Jerjes W, Upile T, Radhi H, Petrie A, Abiola J, Adams A, et al. cTNM vs pTNM: The effect of not applying ultrasonography in the identification of cervical nodal disease. *Head Neck Oncol.* 2012;4:22-5.
16. Figueiredo PT, Leite AF, Freitas AC, Nascimento LA, Cavalcanti MG, Melo NS, et al. Comparison between computed tomography and clinical evaluation in tumour/ node stage and follow up of the oral cavity and oropharyngeal cancer. *Dentomaxillofac Radiol* 2010;39:140-8.
17. Azam SM, Rahman BQ, Akhter M, Hossain SM, Asadullah M, Rahman AS et al. Detection of Cervical Lymph node Metastasis in Oral Squamous Cell Carcinoma by Ultrasonogram Guided Fine Needle Aspiration Cytology (FNAC) and Comparison with Computed Tomographic (CT) Findings. *KYAMC Journal.* 2014;4(2):391-7.
18. Khurajam SD, Sarkar R, Haldar B, Rasaily N, Khurajam S, Debnath K. Aspiration cytology of metastatic neck node: A 5-year study. *J Med Soc* 2015;29:160-3.
19. Mehdi G, Singh AK, Hasan M, Ansari HA, Rehman S, Mirza S, et al. Cytological evaluation of enlarged lymph nodes in metastatic disease: A hospital-based assessment. *Clin Cancer Investig J* 2015;4:152-7.
20. Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. *Oral Oncol.* 2009;45:309–16.
21. Paiva RR, Figueiredo PT, Gracia MA, Guerra EN. Oral cancer staging established by magnetic resonance imaging. *Braz Oral Res* 2011;25:512-8
22. Steel BL, Schwartz MR, Ramzy I. Fine needle aspiration biopsy in the diagnosis of lymphadenopathy in 1,103

- patients. Role, limitations and analysis of diagnostic pitfalls. *Acta Cytol* 1995;39:76-81.
23. Haque MA, Talukder SI. Evaluation of fine needle aspiration cytology (FNAC) of the lymph node in Mymensingh. *Mymensingh Med J* 2003;12:33-5.
 24. Sundar SB, Rao NR, Faheem MK. Epidemiological and clinicopathological study of oral cancers in a Tertiary care hospital. *Int J Biol Med Res.* 2012;3:2376–80.
 25. Qadri SK, Hamdani NH, Shah P, Baba KM. Metastatic lymphadenopathy in Kashmir valley: A clinicopathological study. *Asian Pac J Cancer Prev* 2014;15:419-22.
 26. Donaduzzi LC, De-Conto F, Kuze LS, Rovani G, Flores ME, Pasqualotti A. Occurrence of contralateral lymph neck node metastasis in patients with squamous cell carcinoma of the oral cavity. *J Clin Exp Dent* 2014;6:209-13.
 27. Wilkinson AR, Mahore SD, Maimoon SA. FNAC in the diagnosis of lymph node malignancies: A simple and sensitive tool. *Indian J Med Paediatr Oncol* 2012;33:21-4.
 28. Alam K, Maheshwari V, Haider N, Siddiqui FA, Jain A, Khan AH. Fine needle aspiration cytology (FNAC), a handy tool for metastatic lymphadenopathy. *Int J Pathol* 2010;10:DOI: 10.5580/1df3.
 29. Hafez NH, Tahoun NS. Reliability of fine needle aspiration cytology (FNAC) as a diagnostic tool in cases of cervical lymphadenopathy. *J Egypt Nat Canc Inst.*2011; 23(3):105-14.
 30. Dabirmoghaddam P, Sharifkashany S, Mashali L. Ultrasound-Guided Fine Needle Aspiration Cytology in the Assessment of Cervical Metastasis in Patients Undergoing Elective Neck Dissection. *Iran J Radiol.* 2014; 11(3): e7928. doi: 10.5812/iranradiol.7928.