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Original Article

Oncology Section

Use of 90° Hopkin's Telescopic Examination as an OPD Tool to Clinically Evaluate and Record Oral Cavity Lesions: Our Experience in Early Detection, Especially in Patients with Limited Mouth Opening

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ABSTRACT

Introduction: Restricted mouth opening due to premalignant lesions like oral sub-mucous fibrosis, malignancies of oral cavity and postoperative status is very common in Indian patients. It is very difficult to evaluate, document and biopsy the lesions due to inability to access, vast area and diversity of premalignant lesions and subject variations. 90° Hopkin's slender out-patient examination telescope was found useful tool in this.

Aim: The aim of the study was to evaluate the use of magnified view and reach of a slender telescope to document and examine the oral cavity for any premalignant and malignant lesions, especially for patients with restricted mouth opening and to study its impact on management.

Materials and Methods: A 90⁰ Hopkin's telescope was used to evaluate and document oral cavity examination in the Out Patients Department (OPD). The data of first 2000 patients was analysed.

Results: Difficult to reach areas, where mouth opening was severely restricted was the significant subset. A total of 1394 patients approached OPD for primary diagnosis at our tertiary cancer care centre. Six hundred and six patients were the ones in follow up after treatment in form of Surgery, Chemotherapy or Radiotherapy, or combination. Five twenty three patients (of 1394) with mouth opening ≤ 20mm formed the study group. Telescope guided biopsies were also taken in 50 patients from 56 sites. Serial recordings were compared objectively in premalignant, treatment evaluation and close watch groups. An increase of 5.6% in rate of diagnosis of malignancy was made possible with the help of telescopic examination in patients with mouth opening ≤ 20mm.

Conclusion: A 90⁰ Hopkin's telescopic examination is a useful tool to evaluate and record oral cavity lesions, especially in patients with restricted mouth openings. It is a useful tool for screening high risk group, giving definite advantage of objective evaluation and recording of the lesion. It can also be used to objectively evaluate response of neo-adjuvant chemotherapy and as a teaching tool for the fellows.

Keywords: Oral cancer, Oral sub mucous fibrosis, Prevention

INTRODUCTION

Oral cancer is a major health problem in the Indian subcontinent where it ranks among the top three types of cancer in the country [1]. Oral cancer is of significant public health importance to India. It is diagnosed at later stages which result in poor treatment outcomes and considerable costs to the patients who typically cannot afford treatment [2]. Most oral malignancies occur as squamous cell carcinomas (SCCs); despite remarkable advances in treatment modalities, the 5-year survival rate has not significantly improved over the past several decades and still hovers at about 50-60% [3].

Many oral SCCs develop from premalignant conditions of the oral cavity [4,5]. A wide array of conditions have been implicated in the development of oral cancer, including leukoplakia, erythroplakia, palatal lesion of reverse cigar smoking, oral lichen planus, oral submucous fibrosis, discoid lupus erythematosus, and hereditary disorders such as dyskeratosis congenital and epidermolysis bullosa [6].

Despite the general accessibility of the oral cavity during physical examination, many malignancies are not diagnosed until late stages of disease. In order to prevent malignant transformation of these precursor lesions, multiple screening and detection techniques have been developed to address this problem. Delay in diagnosis has also been largely associated with advanced stages of oral cancer [7]. Earlier detection of oral cancer offers the best chance for long term survival and has the potential to improve treatment outcome and make healthcare affordable [8].

There are many factors which hampers early diagnosis of oral cancers. Limited mouth opening due to various reasons like OSMF (oral sub mucous fibrosis), and fibrosis and distorted anatomy due to previous surgeries limits clinical examination in these patients, which may in most of the cases, lead to delay in detection of cancer at an early stage.

With the aim of doing a proper and complete oral examination, especially in patients with limited mouth opening, we have used 90° Hopkin's telescope as an routine OPD tool in our practice to clinically evaluate and record the oral cavity status in patients with oral cavity lesions and evaluate the use of magnified view and reach of a slender telescope to document and examine the oral cavity for any premalignant and malignant lesions, especially for patients with restricted mouth opening and to study its impact on management of these cases.

MATERIALS AND METHODS

After obtaining the clearance for the study from the Institutional Ethics Board (IEB) an observational study was conducted in the out-patient department of the Department of Head-Neck Surgical Oncology at a tertiary care cancer centre from February, 2008 to May, 2013.

All the patients (including the new and the follow-up patients) who presented to the OPD during this time frame were included in the study after taking a proper informed consent from the patients.

A 90^0 Hopkin's telescope was used to evaluate and document oral cavity examination. Patient recording were archived in the system with the designated ID given to the patient. The data of first 2000 patients was analysed in this study which included1394 patients who presented in the OPD for primary diagnosis at our tertiary cancer care centre and 606 patients who were in follow up after treatment in form of surgery, chemotherapy or radiotherapy, or combination.

Following aspects were noted in observations:

- Mouth opening was recorded as inter incisor distance (IID) in dentate patients and Inter-alveolar distance in edentulous patients.
- Presence of any premalignant lesion (leukoplakia, erthyroplakia, proliferative verrucous leukoplakia) or any premalignant condition (Oral sub-mucous fibrosis, lichen planus, discoid lupus erythematous, etc.)
- Absence/ presence of growth/ulcer suggestive of malignancy.
- Response to each cycle of neo-adjuvant chemotherapy in locally advanced borderline operable cases.

Technique of 90˚Hopkin's Examination

The patient was seated comfortably on an examination stool. The oral cavity and the posterior pharyngeal wall were anaesthetised with 10% xylocaine spray. A 90˚ Hopkin's rigid telescope attached to a 3 chip camera and recording system was used for examination and recording. The 90˚Hopkin's telescope lens was pre-heated to avoid fogging. The temperature was checked before inserting the scope in the oral cavity. Using a Lack's tongue retractor, various sub-sites of the oral cavity were sequentially examined and magnified images of the same recorded. Any suspected lesion was recorded, with special emphasis on the extent, status of surrounding peri-lesional mucosa, involvement of surrounding sub-sites.

Serial recordings were compared objectively in premalignant, treatment evaluation and close watch groups. All the premalignant lesions were closely followed.

Out of the 2000 patients examined, 523 patients had IID ≤ 20mm, which comprised the study group. Among these 523 patients naked eye clinical examination was compared to the telescopic examination by 90˚ Hopkin's telescope of the oral cavity to detect any premalignant lesion or condition or any other frank malignant lesion.

RESULTS

Of the 2000 patients studied, 1239 (61.95%) were males and 761 (38.05%) were females, with mean age of presentation being 43.7 years (Range 23-79 years).

The mouth opening of the patients were recorded and tabulated in [Table/Fig-1]. Further the various pathologies of the oral cavity studied with the 90˚ Hopkin's telescope were recorded in [Table/Fig-2].

The premalignant lesions were closely followed up and in presence of high clinical index of suspicion, biopsied. The biopsy results were analysed in form of absence or presence of malignancy and T stage correlation at time of final histopathological examination [Table/Fig-3].

Of the 523 patients with IID ≤ 20mm, both clinical and telescopic examination was performed. In 50 patients naked eye clinical examination could not be done due to limited mouth opening, but the telescopic examination revealed 56 lesions in them. Thirty six were located in posterior buccal mucosa and RMT region (64.28%). Out of all guided biopsies, 9 were found to be malignant (16.7%) and 20 (35.7%) were premalignant. Two patients were in Tis, 6 in T1 and 1 in T2 stage, amounting 88% in stage T1 or early. Thus with the use of 90˚ Hopkin's examination, an increase in detection rate by 5.6% was achieved which was statistically significant with p<0.03 on applying the Chi-square test. Their diagnosis and the subsequent biopsies were made possible due to the examination with the 90˚ Hopkin's telescope. They were biopsied under local anaesthesia, under guidance of the scope [Table/Fig-4].

The patients were kept on a regular follow-up every 6 months and underwent complete oral screening including 90˚ Hopkin's examination for early detection and subsequent biopsy and

Mouth opening	Total Numbers	Percentage of total
<10 mm	211	10.55
10 to 20 mm	312	15.6
20 to 30 mm	631	31.55
>30 mm	846	42.3
Total	2000	

[Table/Fig-1]: Observation of mouth opening

Observation	New patients	Patients on follow-up post any treatment form	Total
Total	1394	606	2000
OSMF	492	170	662
Premalignant lesions	436	85	521
Growth / Ulcerative lesion	1115	52	1167
ORN / Non healing area		148	148

[Table/Fig-2]: Recorded conditions of oral cavity on 90˚ hopkin's telescopic examination
{OSMF: Oral Sub mucous Fibrosis, ORN: Osteo-radio-necrosis}

	New patients	Patients on follow-up post any treatment form	Total
Observed closely	332	73	405
Required biopsy	104	12	116
Biopsy Malignant	52	6	58
Tis	8	1	9
T1	29	2	31
T2 or greater	15	3	18

[Table/Fig-3]: Observations in premalignant group

Site	Numbers	Premalignant	Carcinoma	Non malignant
RMT	24	7	2	15
Buccal Mucosa	12	8	1	3
Oral tongue	2	1		1
Floor of mouth	4	1	1	2
Lower alveolus	6	2	2	2
Upper alveolus	8	1	3	4
Total	56	20	9	27

[Table/Fig-4]: 90˚ Hopkin's telescope guided biopsy group (n= 56)

	Male			Female	
Site	IR	AAR	Site	IR	AAR
Mouth	13.9	9.5	Breast	21.3	11.1
Tongue	13.5	9.3	Cervix	19.1	9.9
Lung	10.2	8.3	Ovary	5.6	3.0
Hypopharynx	5.4	4.2	Mouth	5.5	2.8
Oesophagus	4.9	3.8	Tongue	4.0	2.1

[Table/Fig-5]: Leading cancer sites, Public Based Cancer Registry 2009- 2010, Ahmedabad district area, India
IR: All India average
AAR: Ahmedabad average

treatment in case of any suspected lesion seen on examination. The rigid scope examination was very helpful in detecting any lesion especially in patients with mouth opening ≤ 20mm in which naked eye examination was not possible.

Out of the 1394 new patients, 231(16.6%) patients were deemed as borderline operable with locally advanced cancers. These patients underwent a clinical recording of the lesion with the rigid scope at the time of initial presentation. These patients were then referred for two to three cycles of neo-adjuvant chemotherapy (NACT). Before each cycle, the lesions were again recorded by the rigid scope and compared with the initial recording to give an objective evaluation of the response to NACT and to decide about the further treatment option based on the response.

DISCUSSION

Oral cancer is a heterogeneous group of cancers arising from different parts of the oral cavity, with different predisposing factors, prevalence, and treatment outcomes. It is the sixth most common cancer reported globally with an annual incidence of over 300,000 cases, of which 62% arise in developing countries [9]. Oral cancer is a major problem in the Indian subcontinent where it ranks among the top three types of cancer in the country [1]. According to Globocan 2012 data, lip and oral cavity cancers has the highest incidence rate amongst all cancers in males in India [10]. The incidence rate is 11.3%, age adjusted rate (AAR) 10.1%. The mortality rate is 10.2%, AAR 6.7% and the 5 year prevalence rate is 12.6%.

In Ahmedabad district area of India where the Institute is located, according to Public Based Cancer Registry 2009- 2010, Oral cavity cancer incidence is highest among all the cancers in males and amongst cancers of non-female organs in females also [11] [Table/Fig-5].

With the development and success of screening programs for breast, cervical, and colon cancer, the potential to reduce the morbidity and mortality of oral cancer through early detection modalities is of critical importance. Data indicates that the diagnosis of oral squamous cell carcinoma (SCC) at an early stage of disease allows for less aggressive treatment, improves quality of life, and improves the overall 5-year survival rate when compared with SCCs diagnosed at late stages [3].

The gold standard criterion for diagnosis of oral lesions is histopathologic analysis via the procurement of a tissue sample by surgical biopsy. Because of the invasive nature of surgical biopsy, early detection techniques are designed to provide a minimally invasive assessment of the malignant potential of the lesion that guides the approach to diagnosis and treatment of these lesions.

The approaches to the screening and detection of malignant and potentially malignant conditions have the potential to drastically alter the course of oral cavity disease but have yet to effectively reduce the overall morbidity and mortality of oral cancer. The major modality designed to reduce this burden include oral cavity examination.

ORAL CAVITY EXAMINATION

The examination of the oral cavity has traditionally been the preferred approach for the detection of oral mucosal abnormalities. As a non-invasive technique, the oral cavity examination can be performed quickly, is without additional diagnostic expense to the patient, and may be performed by health care professionals across a multitude of disciplines.

The study, performed by the "Kerala" group in India, demonstrated improved survival rates at 9 years among males with high-risk habits (tobacco use) [11]. Although an increase in survival for the overall population was not seen, this study was the first to clearly support the efficacy of an oral cancer screening program in a high-risk population [12].

Another study from India demonstrated that oral cancer screening by trained health workers can lower mortality of the disease—especially in individuals with a history of tobacco use [13]. In this randomised, controlled trial of almost 192,000 people, carried out over an eight-year period, there was a significant reduction in mortality in the intervention arm (29.9 cases per 100,000) versus the control arm (45.4 cases per 100,000), due to detection of oral cancer at an early stage.

But with the presence of trismus, with mouth opening ≤20mm as a result of any premalignant lesion or condition or as a result of fibrosis and distortion of anatomy induced due to a previous surgery, the naked eye oral clinical examination becomes very difficult and all areas of the oral cavity, especially the areas of the retro-molar trigone, tonsillo-lingual sulcus, base of tongue cannot be examined properly. Thus a visualization aid is required to improve and enhance the clinical examination of these tough to reach areas. Also, early oral cavity cancerous and pre-cancerous lesions are very subtle and may not give symptoms. They are heterogeneous and many a times their transformation to early malignant lesions can be missed with naked eye and examination under magnification can be helpful [14,15].This is especially true with a patient with limited mouth opening and areas difficult to reach or illuminate.

A 90^0 rigid telescopic examination in OPD has certain advantages. As the scope is slender and has built in illumination, it can reach difficult areas and give properly illuminated and magnified visuals. The 90^0 scope is especially useful to evaluate posterior alveolus and anterior floor mouth areas in patients with mouth opening less than 20mm. The visual is stored in form of a video clip in the server, which can be available for future comparison. This provides objective evaluation for the lesion and response to the treatment. Peri-lesion mucosa can be better evaluated with magnification of telescope. Few difficult to reach areas in presence of trismus as a result of OSMF or distorted anatomy due to previous treatment can be efficiently assessed with telescopic examination and lesions can be biopsied under the visual guidance.

In our study, telescopic examination could help locate suspicious lesions in 50 out of 523 (9.6%) patients. Thus an increase of about 5.6% ($p<0.05$) in diagnosis of premalignant and malignant lesions was made due to utilization of telescopic examination, which was statistically significant. Similarly in a study by Eryilmaz et al., the diagnostic accuracy by telescopic examination in cases of laryngeal cancers was better than computed tomography (CT), with telescopy providing better insight when deciding between partial or total laryngectomy and a healthier evaluation of the resection margin [16].

Tissue distinction between infective granulomatous lesion, osteoradionecrosis (ORN) and malignancy becomes difficult with naked eyes, especially in difficult to reach and poorly illuminated areas. Telescopic examination helped in diagnosing it correctly and objectively staging the local area and disease with help of magnification. Treatment response to ORN was also objectively documented. Similar results were seen in a study by Casiano et al., which concluded that the increased illumination and magnification afforded by rigid fiberoptic telescopes during video laryngoscopy allowed detection of subtle vocal fold pathology, otherwise missed by indirect laryngoscopy [17].

Also, the rigid telescope could be used as teaching tools for the fellows as it provides a better magnification and illuminated view of a narrow cavity on a wide screen, making it easy for the fellows to appreciate subtle changes in the oral cavity resulting from a premalignant lesions and conditions. Similarly in a study by Jabbour et al., the rigid telescope was found to be a useful tool for teaching and assessing cleft palate and pharyngoplasty surgery [18].

In the patients treated with Neo adjuvant chemo therapy (NACT), objective response analysis and evaluation of the response can be

documented with serial telescopic examination. The recordings of pre-NACT can be compared with the recording of telescopic examination after each cycle of NACT to evaluate response. Clinical response can also be better evaluated with magnification and thus proper assessment of response can be made to NACT and thus proper decision can be taken about the further treatment of the patient in the form of surgery or chemo-radiation according to the response to NACT.

CONCLUSION

OSMF and precancerous lesions in oral cavity are very common in Indian patients. It results in less than 20 mm mouth opening in almost 26 to 29% of patients. Objective analysis of oral cavity is very difficult in this group. With the use of telescope, these areas can be visualised better and documented objectively. It can prevent cancer by detecting premalignant lesions effectively. Highly suspicious lesions can be biopsied early, resulting in almost 68% of them being picked up at the stage T1 or below. Other observations like ORN pattern, response to treatment and clinical effect of NACT are can also be documented objectively. Further the telescopic examination can go a long way as a teaching tool for the fellows by providing then with an illuminated and a magnified view of the lesions. Thus, we hypothesise that 90˚ Hopkin's telescope can be used as a routine OPD tool to clinically evaluate the oral cavity specially for patients with restricted mouth opening for early detection, treatment and prevention of oral cancers because of its magnified view and easy reach.

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