

Assessment Of Sentinel Lymph Nodes In Oral Squamous Cell Carcinoma - A Literature Review

Research Article

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Introduction

Squamous cell carcinoma or epidermoid carcinoma is a type of cancer that results from squamous cells [1]. It consists of different types of which Ninety percent involve head and neck [2].

Lymph nodes, commonly referred as the Dustbin of the body, is a physiological accumulation of the lymphatic system which drains cellular end products from the entire body. Hypothetical first lymph node or group of nodes draining a cancer is known as a sentinel lymph node/nodes. In case of established cancerous conditions sentinel lymph nodes are said to be first targeted by the metastasizing cancer cells.

Oral squamous cell carcinoma metastasizes to the cervical nodes, yet the clinical staging can not detect metastases less than 8 to 10 mm in size with the help of physical examination, CT scan, MRI. Thus the conventional procedure done for the patients with negative clinical nodal involvement (N0) is neck dissection which causes loco- regional lymph control and regional recurrence free survival; But, 70 percent of the clinically N0 patients with negative neck histologically for metastasis, the neck dissection is an aggressive procedure. The neck dissection procedure is traditionally recommended for the patients with 15-20 % risk of the lymphatic metastasis [3]. The risk of nodal metastasis on oral squamous cell carcinoma is 20% of nodal metastasis, still the majority of the patients undergo neck dissection with no nodal metastasis [4].

Considering the efficacy of the sentinel lymph node biopsy in treatment planning of the oral squamous cell carcinoma patients this review was done.

Methods

The studies published till January 2018 were searched on the PubMed index limited to human subjects were searched. The search

terms were: (1) sentinel nodes (2) oral and (3) squamous cell carcinoma. The criteria for inclusion was the : (1) original studies (2) prospective studies (3) studies evaluating the role SLNB in OSCC in N0 patients. Review articles and meta analysis studies were collected to support the data in the discussion and frame the introduction of the article. The references were examined and the relative articles were included for this review.

Data Extraction

The data was extracted on the author's name, type of study, year, type of patients, tumour staging image analysis method, surgical techniques used and histological techniques used for the evaluation of sentinel nodes.

All parameters involved in the sentinel lymph node biopsy were used to determine the reasonable and useful to establish the art of the procedure.

Discussion

Sentinel lymph node biopsy is the standardised technique of staging of tumour in Melanoma and breast cancer according to the international guidelines of management of these tumours [5, 6]. Due to great variability of regional lymphatic migration and lymphatic vessels, this procedure is very complicated in head and neck region.

In oral squamous cell carcinoma, first studies were published in 1999, after seven years the technique got acceptance in breast and melanoma. Two interesting prospective papers published in 2004 and 2002 are included as they reach every required criteria with good number of patients and had detailed data of survival respect to the histological examinations of IHC [7, 8]. The results in low number of studies with more than 30 patients were compared to this; however, it was similar to the reviewed meta analysis [9].

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To improve the intra operative identification of sentinel lymph nodes, the recent advances focus on the development of the radiotracers imaging and molecular assays. These may help in overcoming the obstacles to widespread implementation of sentinel lymph node biopsy for oral squamous cell carcinoma N0.

Sentinel Node preoperative localization

Lymphoscintigraphy is the most common method to preoperatively localize the sentinel lymph node after injecting a radioactive sentinel lymph node tracer, without the use of blue dye. It may also be useful for detection of sentinel lymph nodes during the surgery; however, there were no significant differences in terms of SS or NPV. Multiple mechanisms can cause false negative which include incomplete or adequate peritumoral injection, obscuring the sentinel node by shine through the radioactive signal at the tumour site, and the obstruction of the lymphatic vessels to the obstructed nodes. Resulting in redirection of the lymphatic flow [10]. Dynamic images in a trend to identify the lymphatic migration to the sentinel nodes were employed by nine authors. The predominant clinical experience with sentinel lymph node biopsy is seen in oral cavity tumours. Still there is some debate in the literature regarding the accuracy of sentinel lymph node biopsy for the tumours of floor of the mouth compared to other oral locations [11, 12]. Antonio et al., [13] state that the dissection of the levels Tomographic imaging techniques that can separate tracer uptake of adjacent organs can solve this problem, especially the hybrid techniques for ex. SPECT-Computed Tomography that by their much greater anatomical resolution and image quality are much more appropriate. It has to be noted that only three authors use these techniques to help identifying lymph node stations more accurately in various forms, as well as its relations with adjacent structures[14].

Intraoperative procedure

Radioguided surgical probe was employed in eleven articles in the surgical room; one of them was added with a portable intra operative gamma-camera [15]. It is recommended to previously identify the SN and its anatomical location based upon the images examination and labelling marks on the skin of the patient when the probe is used exclusively. A close collaboration between the physicians of nuclear medicine and surgeons is recommended for this procedure. The surgeon must perform a lumpectomy before the Sentinel Node Biopsy to avoid shine through effect. Additional images can be acquired with portable gamma-camera and identify the SN of the regions close to the tumour that could be missed in the initial images after the lumpectomy.

A new detection system based on a freehand SPECT performed in the operating room before surgery and even intra operatively after lumpectomy was used by Bluemel et al., [16] in a period less than two minutes, that eliminated the peritumoral tracer activity and improved the location of those lymphatic echelons close to the tumour and eliminating the shine-through effect.

No agreement was found in which the adequate number of SN would be biopsied. This is still controversial in OSCC as the possibility of great number of SN, variability of different lymphatic echelons, frequent contralateral migration, etc. It would be recommended to excise at least, all hot cervical nodes found in the images.

Histological techniques

Histological techniques used are very important point in the sentinel node biopsy process. Except one, all the items with available data employed HE, SSS and IHC analysis for cytokeratin. The importance of the three techniques for reaching the highest accuracy was remarked. One of the biggest potential disadvantage of a strategy of Sentinel Node Biopsy as compared with upfront elective Neck Dissection is the need for second procedure on a separate occasion for a completion Neck Dissection for a positive Sentinel Lymph Node Biopsy. In spite of immediate intra operative frozen section can identify a significant proportion of patients with a positive Sentinel Node Biopsy, A subset of patients whose occult disease will only become apparent with SSS and IHC analysis still remains [17]. The increased cost, morbidity and delay in healing that comes from a second procedure are consider as an obstacle to the implementation of Sentinel Node Biopsy by many authors. A more efficient method for the intra operative genetic detection of lymph node metastasis in head and neck squamous cell carcinoma using the one-step nucleic acid amplification (OSNA) method of cytokeratin-19 was attempted to developed by some authors [18].

Conclusion

Sentinel Node Biopsy is an effective diagnostic method in Oral Squamous Cell Carcinoma. It is a less invasive, easy to perform and can be used as a potential alternative to neck dissection. It also reduces the operative time and intraoperative and postoperative complications that occur in neck dissection.

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