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THE UTILITY OF FROZEN SECTION PATHOLOGY IN ORAL SQUAMOUS CELL CARCINOMA - A SYSTEMATIC REVIEW

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BACKGROUND

Oral squamous cell carcinoma (SCC) is the most common head and neck malignancy with approximately 200,000 cases diagnosed each year and 100,000 patient deaths annually. Due to the complex oral anatomy and decreased visual and physical access, achieving adequate surgical margins on primary excision of oral SCC can be challenging. Frozen section histopathological analysis aims to examine tissue samples intraoperatively and assess the adequacy of tumour resection margins to guide further treatment. The literature surrounding its use and impact on improving final margin status, recurrence and survival in cases of oral SCC is mixed.

OBJECTIVES

This study aimed to systematically review the literature and compare final margin status, locoregional recurrence and overall survival between cases of oral SCC surgically resected with frozen section intraoperative analysis versus gross examination of the tumour specimen alone.

METHODS

A systematic review was conducted adhering to the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines. A search was performed in EMBASE, PubMed, Cochrane Library and Scopus. Observational and experimental studies that directly compared one or more of the primary outcomes between the two cohorts were considered for inclusion.

References

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RESULTS

Five studies met the inclusion criteria (Table 1) . Due to a paucity of data and study heterogeneity a meta-analysis was not performed. A total of 1607 patients with oral SCC treated with surgical resection were included. 862 and 745 cases of oral SCC were resected with frozen section and clinical examination respectively. The percentage of cases treated with frozen section ranged from 45.06% (Mair et al.) to 66.01% (Miyawaki et al.). A majority of patients in all five studies were male (range 57.3% to 87.6%). The mean age of patients was over 60 years for all studies.

There was no significant difference in final margin status, disease free survival or overall survival between cases of oral SCC resected with the use of frozen section intraoperatively and with clinical examination alone. All five studies compared the utility of intraoperative frozen section histopathological analysis versus clinical examination and resection of oral SCC. The method in which frozen section was performed and reported in the studies varied significantly.

Study	Sample	Primary Outcomes		
		Margins	Recurrence	Survival
Binahmed et al. (1)	425 patients FS: 225 (52.94%) CE: 200 (47.06%)	Final Positive: 62 (14.6%), FS 36/225 (16%), CE 26/200 (13%) p=0.381	Not Reported	Not Reported
Gerber et al. 2011 (2)	178 patients FS: 111 (62.4%) CE: 67 (37.6%)	Final Positive: FS, 22/111 (19.8%); CE, 19/67 (28.4%), OR 0.70, p=0.40	Not reported	Not Reported
Mair et al. 2017 (3)	435 patients FS: 196 (45.06%) CE: 239 (54.94%)	Post revision: Close/positive: FS, 13/196 (6.63%); CE, 16/239 (6.69%). P=0.855 Pre-revision: Close/positive: FS, 25/196 (12.75%); CE, 43/239 (17.99%) p=0.134	Local: 32/109 (29.35%) Regional: 33/109 (30.27%) Distant: 28/109 (25.68%) No comparison CE & FS Time to recurrence: Not reported	OS (14 months) FS, 90.4%; CE, 90.9%. P=0.325 DFS (14 months) 326 combined (74.9%). FS, 86.7%; CE, 83.5%. P=0.469
Miyawaki et al. 2015 (4)	153 patients FS: 101 (66.01%), CE: 52 (33.99%)	Pre-revision: Positive FS: 4/101 (3.9%) CE: 5/52 (9.6%) p>0.16	Local: CE, 9/52 (17.3%); FS, 7/101 (6.9%). P=0.047 Time to recurrence: CE, 3 to 47 months; FS, 3 to 21 months	DSS Overall (32 months) CE, 81.5%; FS, 87.9%. P>0.05
Pathak et al. 2009 (5)	416 patients FS: 229 (55.1%) CE: 187 (44.9%)	Final margins: FS: Clear 70.4%, 15.4% involved, 14.2% close CE: Clear 67.4%. No significant difference between FS and CE (p>0.05)	Recurrent disease: 137/416 (32.9%), of recurrent disease local most common (60/416, 14.4%) Hazard of failure at primary site not influenced by FS (p=0.438). No difference in 5-year primary failure rate: FS 25.2%, CE 20.1% (p>0.05)	219 patients (52.6%) were alive and 72 (17.3%) had died of disease. No significant difference in OS (P=0.836), DFS (p=0.378), DSS (p=0.880) between FS and CE No difference in 5-year DSS: FS 83.5%, CE 80.1% P>0.05

FS: Frozen Section, CE: Clinical examination, OS: Overall survival, DFS: Disease Free Survival, DSS: Disease Specific Survival

CONCLUSION

As a result of the current findings, including but not limited to the significant monetary cost incurred and the time required, the routine use of frozen section analysis in the surgical treatment of oral SCC is not recommended.