

Supplementary Online Content

Tasche KK, Buchakjian MR, Pagedar NA, Sperry SM. Definition of “Close Margin” in Oral Cancer Surgery and Relationship of Different Margins to Local Recurrence Rates. *JAMA Otolaryngol Head Neck Surg*. Published online April 26, 2017. doi:10.1001/jamaoto.2017.0548

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eFigure. Local recurrence based on margin distance, stratified by use of adjuvant radiation

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1 – Local recurrence rate by successful intraoperative additional tissue excision

| Specimen Margin | N | Successful additional tissue excision | |
|-----------------|--------------------|---------------------------------------|--------------------|
| | | Yes | No |
| Positive | 25:56 ^a | 0.6 (0.41 – 0.77) ^b | 0.38 (0.26 – 0.51) |
| <1 mm | 12:42 | 0.25 (0.09 – 0.53) | 0.29 (0.17 – 0.44) |
| 1-5 mm | 28:97 | 0.14 (0.06 – 0.31) | 0.14 (0.09 – 0.23) |
| >=5 mm | 8:86 | 0.25 (0.07 – 0.59) | 0.09 (0.05 – 0.17) |

Abbreviations: LR, local recurrence; N, the number of non-missing values;

^a Number of ‘Yes’ : Number of ‘No’

^b Rate (95% confidence interval)

eTable 2 – Local recurrence rate by adjuvant radiation treatment

| Specimen Margin | N | Adjuvant radiation | |
|-----------------|--------------------|---------------------------------|--------------------|
| | | Yes | No |
| Positive | 38:43 ^a | 0.53 (0.37 – 0.68) ^b | 0.37 (0.24 – 0.52) |
| <1 mm | 29:25 | 0.28 (0.15 – 0.46) | 0.28 (0.14 – 0.48) |
| 1-5 mm | 45:80 | 0.13 (0.06 – 0.26) | 0.15 (0.09 – 0.24) |
| >=5 mm | 24:70 | 0.21 (0.09 – 0.40) | 0.07 (0.03 – 0.16) |

Abbreviations: LR, local recurrence; N, the number of non-missing values;

^a Number of ‘Yes’ : Number of ‘No’

^b Rate (95% confidence interval)

eTable 3 – Literature review of local recurrence and survival based on margin

| Author, year | N | Site | T stage | Definition of margins | Therapy | LR for positive/close margins | LR for negative margins | Survival, positive margins | Survival, negative margins |
|--------------|-----|-------------------------------|---------|---|------------------------------------|---|---|--|---|
| Looser, 1976 | 62 | All except glottis, cutaneous | All | Pos = dysplasia /CIS or cancer at margin; Close = <5 mm Neg = ≥5 mm | Primary surgery | 71% | 31.7% | 5 yr OS 30.6% | 5 yr OS 35.9% |
| Byers, 1978 | 216 | All sites | All | Pos = CIS or cancer at margin | Primary surgery | 80% | 16% | 2 yr OS 5% | 2 yr OS 66% |
| Vikram, 1984 | 107 | All | All | Pos = cancer at margin; Close = <5 mm; Neg = ≥5 mm | Primary surgery + adjuvant RT | Pos = 11% Close = 4% | 2% | NA | NA |
| Scholl, 1986 | 214 | Tongue | All | Pos = cancer at margin Neg = all others | Primary + salvage surgery included | Small number; did not look at positive margin as a separate group | Neg = 13% Neg after add'l resection = 22% Overall = 15% | Small number with poor survival; did not look at positive margin as a separate group | 5 yr OS Neg = 49% Neg after add'l resection = 31% |
| Loree, 1990 | 398 | Oral cavity, | All | Pos = cancer at | Primary surgery | Pos = 36% | 18% | 5 yr: Pos = | 5 yr OS: |

| | | | | | | | | | |
|-------------------|---------|-----------------------------------|-----|---|---|--|-------|---|----------------------|
| | | no lip | | margin Close = <5 mm Neg = ≥5 mm | ± adjuvan t RT | Close = 35% Dysplasi a = 33% CIS = 44% | | 43% Close = 51% Dyspl asia = 94% CIS = 71% | Neg = 60% |
| Ravas z, 1991 | 80 | All except lip | All | Pos = cancer at margin Close = <5 mm CIS = CIS at margin Neg = ≥5 mm | Primary surgery + adjuvan t RT | Pos = 31% ^a Close = 29% CIS = 14% | 12.5% | NA | NA |
| Yuen, 1998 | 50 | Oral tongue | All | Pos = cancer at margin Close = <10 mm | Primary surgery + salvage surgery after RT failure (n = 5); ± adjuvan t RT | 0 mm = 29% 1 mm = 25% 2 mm = 13% 3 mm = 0% 4 mm = 14% 5 mm = 13% 6 mm = 0% 8 mm = 0 % 10 mm = 50% Overall = 16% | NA | | |
| Woolga r, 1999 | 20 0 | Oral cavity, orophar ynx | All | Pos = cancer at margin Close = <5 mm Neg = ≥5 mm | Primary surgery ± adjuvan t RT | NA | NA | OS Pos = 11.1% Close = 35.7% | OS Neg = 62.6% |
| Spiro, 1999 | 14 6 | Oral tongue | All | Pos = cancer at margin Close = within 1 HPF Neg = ≥1 HPF | Primary surgery ± adjuvan t RT | Pos = 36% Not specified for close | 12% | 5 yr OS = ~60% for all groups | |
| Sutton, | 20 | Oral | All | Pos = | Primary | Pos = 55% | 12% | OS | OS |

| | | | | | | | | | |
|-------------------------|-----|--------------------|-----|--|---|--|--|--|-------------------------------|
| 2003 | 0 | cavity, oropharynx | | cancer at margin; Close = <5 mm Neg = ≥5 mm | surgery ± adjuvant RT | Close = 33% | | Pos = 11% Close = 36% | 60% |
| Brandwein-Geisler, 2005 | 168 | All | All | Pos = cancer at margin; Close = <5 mm (additional resection if on frozen <5mm); Neg = ≥5 mm | Primary surgery and neoadjuvant therapies | Pos = 26% Close = 13% | Neg = 20% Neg after add'l resection = 26% | NA | NA |
| Nason, 2009 | 277 | Oral cavity | All | Pos = cancer at margin; Close = <5 mm; Neg = ≥5 mm | Primary surgery ± adjuvant RT | Pos = 26.2% ≤2 mm = 22.5% 3-4 mm = 14.6% | 8.4% | Pos DFS = 48.3% OS = 38.6% ≤2 mm DFS = 48.5% OS = 62.6% 3-4 mm DFS = 69.5% OS = 69.6% | Neg DFS = 72.9% OS = 70.5% |
| Kurita, 2010 | 148 | Oral cavity | All | Pos = cancer at margin; Close = <5 mm; Dysplasia = dysplasia at margin | Primary surgery ± adjuvant RT | Pos = 56% Close = 24% Dysp = 23% | 9% | NA | NA |

| | | | | | | | | | |
|-----------------|-----|--|-----|--|--|---|---|---|--|
| | | | | though no cancer within 5 mm of margin Neg = ≥ 5 mm | | | | | |
| Wong, 2012 | 192 | Oral cavity, oropharynx | All | Pos = < 1 mm ^b Close = 1-5 mm Neg = > 5 mm | Primary surgery \pm adjuvant therapy | Pos = 26% Close = 11% | 10% | OS ^b 39% DSS 23% | OS ^b 32% DSS 17% |
| Ch'ng, 2013 | 144 | Oral cavity | All | Close = < 5 mm (did not include positive or margins ≥ 5 mm) | Primary surgery only | Local control rate (5 year) ≤ 1 mm = 91.7% 1-2 mm = 88.8% 2-3 mm = 90.4% 3-4 mm = 97.5% 4-5 mm = 100% | | DSS (5 year) ≤ 1 mm = 93.6% 1-2 mm = 88.5% 2-3 mm = 79.6% 3-4 mm = 73% 4-5 mm = 50% | |
| Varvarens, 2015 | 108 | Oral cavity, including mucosquamous carcinoma and adenoid cystic carcinoma | All | Pos = cancer at margin Close = < 5 mm Neg = ≥ 5 mm | Primary and salvage surgery | Pos = 8.3% Close = 26.4% | Neg = 3.4% Neg after add'l resection = 28.6% | Pos: 5 yr OS = 41.7% DFS = 66.7% Close: OS = 58.2% DFS = 56.6% | Neg: OS = 81.3% DFS = 86.2% Neg after add'l resection: OS = 56.2% DFS = 57.1% |

Abbreviations: OS = overall survival; DSS = disease-specific survival; DFS = disease-free survival; LFRS = local recurrence-free survival

^aIncluded both local and regional recurrence

^bUsed cutoff of ≤ 1.6 mm to define positive and > 1.6 mm to define negative based on ROC curve for survival data

eFigure. Local recurrence based on margin distance, stratified by use of adjuvant radiation.

