



The practice patterns in the management of sebaceous carcinoma of the eyelid in the Asia Pacific region

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Received: 31 January 2019 / Revised: 4 March 2019 / Accepted: 13 March 2019 / Published online: 5 April 2019
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Abstract

Purpose To determine the practice patterns of ophthalmic plastic surgeons regarding the management of eyelid sebaceous carcinoma (SC).

Methods An electronic survey was distributed to oculoplastic surgical colleagues in the Asia Pacific region requesting clinical information and treatment approaches to SC.

Results The responses from 192 respondents from the Asia Pacific region was included and analyzed in this study. For initial diagnosis, most surgeons selected incisional biopsy (55%), followed by complete excision (35%). Initial workup was mainly by palpation of lymph nodes, chest X-ray, and computerized tomography scan (CT-scan) of the orbit. Conjunctival map biopsy was done in selected cases. Sentinel lymph node biopsy (SLNB) was done mainly for tumors larger than 10 mm. Management was mainly by surgical excision (5 mm margin) combined with adjuvant therapy in some cases, with radiotherapy being the most common. Margin status was determined most frequently by frozen section as evaluated by the pathologist (57%) followed by Mohs micrographic surgery (18%). Surveillance was based mainly on physical examination alone.

Conclusion The Asia Pacific oculoplastic surgeons prefer incisional biopsy for lesions suspicious of SC prior to definitive surgery. This is in contrast to survey results previously reported in other populations. Frozen section control (done by an oculoplastic surgeon with pathology support) is most commonly used for margin control and conjunctival map biopsies are done only in selected cases. Despite the potential benefits of SLNB, access and expertise in this area is currently lacking in the Asia Pacific region.

Supplementary information The online version of this article (<https://doi.org/10.1038/s41433-019-0432-0>) contains supplementary material, which is available to authorized users.

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Introduction

Sebaceous carcinoma (SC) is the second most common malignant eyelid tumor following basal cell carcinoma in the Asian population [1] and the third most common following basal cell carcinoma and squamous cell carcinoma in the Caucasian population [2]. The reported incidence is higher in the Asian population than in the Caucasian population [3]. The incidence was found to be 0.32 in male and 0.1 in female per 100,000 person-years in the US [4]. SC constituted 1–5% of all malignant eyelid tumors in the US [5], 7.1–11.1% in Hong Kong SAR [3, 6], 31.7% in China [7], and 32.6% in India [8].

It has been coined as the great masquerader due to its variable clinical presentations and multifocal nature in some cases. Difficulties in early recognition combined with its potentially aggressive behavior can lead to poor prognosis. The tumor-related mortality rate was reported

at 6% during mean follow-up of 39.2 months with a 5-year disease-specific survival rate of 92% in a study of 100 patients with SC [9]. With better understanding of the disease and improved histopathological techniques, early diagnosis has improved the overall outcome [10]. The mainstay of treatment is surgical excision with the aim of achieving negative microscopic margins. External beam radiotherapy, cryotherapy, and topical chemotherapy have been used as adjuvant treatment [5]. However, there is no clear consensus on many aspects of management of SC and clinical practice can vary greatly between different populations. Our study aims to identify some of these differences and explore the current practice patterns amongst oculoplastic surgeons in the Asia Pacific region in the management of eyelid SC.

Methods

A survey containing 40 questions regarding the demographics, training background, and practice patterns for management of SC of eyelid was constructed on the website kwiksurveys.com. The survey was in the format of multiple-choice questions and when appropriate, respondents were given the option of selecting one-best answer, multiple answers, or to specify their answer in free-text format. A copy of the survey can be found in Appendix A. Out of the 40 questions, 12 of them could have multiple answers. Respondents could skip questions if they wished to do so. The survey was electronically distributed via e-mail to members of the Asia Pacific Society of Oculoplastic and Reconstructive Surgery (APSOPRS), Hong Kong Society of Oculoplastic and Reconstructive Surgery (HKSOPRS), and individual oculoplastic society directories of the corresponding author. A follow-up e-mail was sent 1 month later as a reminder. The responses were extracted from the online platform and analyzed.

The study protocol was approved by the local institutional research ethics committee, Institutional Review Board of the Hospital Authority Hong Kong West Cluster. The study firmly adhered to the tenets of the 1964 Helsinki declaration and its later amendments.

Results

A total of 263 respondents participated in the survey. Among the 263 respondents, 9 were not from the Asia Pacific region and were excluded, while 63 responders answered fewer than 10 questions and were also excluded. The data from the remaining 192 responders were included in the study.

Geographic distribution, training, and experience with SC of survey respondents

See Table 1, Q.1–7. All respondents were from Asia Pacific countries, primarily Hong Kong (23%), China (18%), South Korea (10%), and India (9%). 68 (38%) respondents practiced primarily in an academic institution and 62 (35%) respondents in the public health care system. The respondents received their oculoplastic surgical training in various regions including the US (34, 18%), Hong Kong (27, 14%), and South Korea (18, 9%). 86 (67%) respondents managed fewer than five cases of SC per year, 26 (20%) managed 5–10 cases per year while 17 (13%) managed more than 10 cases annually. 30 (24%) respondents had managed more than 40 cases of SC in their career. 96 (36%) respondents thought that the most common presentation of SC was a painless eyelid mass and 81 (30%) selected recurrent chalazion as the most common presentation.

Reported practice patterns

See Table 2, Q.8–31. In patients with suspected SC, 74 (55%) surgeons selected an incisional biopsy as their preferred first intervention and 47 (35%) respondents selected full thickness excisional biopsy as the initial step. 106 (35%) respondents undertook physical examination with emphasis on lymph node palpation as work up for newly diagnosed SC. Of the remaining respondents, 81 (27%) performed radiological imaging and 47 (16%) ordered blood work up. Chest radiographs (CXR) and computed tomography (CT) orbit were the most preferred investigative modality regardless of size. 82 (30%) respondents performed conjunctival map biopsy when there was clinical suspicion of pagetoid involvement of conjunctiva, 56 (20%) in recurrent disease, and 52 (19%) if both upper and lower eyelids were involved.

Intraoperatively, 36 (32%) determined surgical margin for excision of SC based on frozen section findings, while 30 (27%) respondents preferred to use 5 mm of clinical margin clearance. Margin clearance was based on frozen section evaluation by a pathologist according to 63 respondents (57%) and Mohs micrographic surgery according to 20 respondents (18%). After excision of SC, reconstruction of posterior lamella using lid sharing procedures was the preferred option of 51 (46%) respondents for upper eyelid and 59 (55%) respondents in lower eyelid.

Adjuvant treatment was selected by 71 (23%) of respondents in the presence of positive margins after surgery. Among the adjuvant therapies, 44 (42%) used radiotherapy and 39 (38%) used topical Mitomycin-C (MMC). Regarding the use of MMC, 50 (48%) respondents followed the regimen 0.04% MMC four times daily for a week,

Table 1 Demographics and training background

Q1. Where is the country of your clinical practice? (can tick more than one option)		
Country	N	Percentage (%)
Total respondents	129	
Hong Kong	30	23
China	23	18
South Korea	13	10
India	12	9
Philippines	11	9
Taiwan	11	9
Singapore	8	6
Japan	3	2
Nepal	2	2
Australia/New Zealand	3	2
Indonesia	9	7
Bangladesh	2	2
Pakistan	1	1
Mongolia	1	1
Q2. Which sector is your clinical practice in (tick as many as applicable)?		
Respondents/total responses	129/177	
Public	62	35
Private	47	27
Academic Institution	68	38
Q3. How many years have you been practicing in your subspecialized in Oculoplastic surgery for?		
Total respondents	129	
<10 years	37	29
10–20 years	59	46
20–30 years	28	22
>30 years	5	4
SD	19.42	
Q4. Where did you receive your oculoplastic training (tick as many as applicable)?		
Respondents/total responses	129/193	
United States	34	18
Hong Kong	27	14
South Korea	18	9
China	15	8
India	14	7
Taiwan	14	7
Other (Please Specify)	10	5
Singapore	9	5
United Kingdom	9	5
Australia/New Zealand	8	4
Europe	7	4
Canada	7	4
China	7	4
Japan	7	4

Table 1 (continued)

Indonesia	3	2
Philippines	2	1
Thailand	1	1
Bangladesh	1	1
Cambodia	0	0
Q5. On average, how many new cases of SC do you manage per year?		
Total responses	129	
<5	86	67
5–10	26	20
>10	17	13
SD	30.63	
Q6. How many total cases of SC have you managed in your career thus far?		
Respondents/total responses	124/123	Percentage (%)
<5	19	15
5–10	23	19
10–20	29	23
20–30	9	8
30–40	13	10
>40	30	24
SD	7.5	
Q7. From your experience, which is the most common presentation of SC (tick as many as applicable)?		
Respondents/total responses	129/268	
Painless eyelid mass	96	36
Blepharoconjunctivitis	35	13
Recurrent chalazion	81	30
Diffuse eyelid thickening	47	18
Orbital signs	7	3
Systemic involvement	1	0
Others (bleeding mass)	1	0

followed by 1 week of rest. In cases with pagetoid spread but without metastasis, complete excision with frozen section control of margins combined with adjuvant therapy was the preferred approach of 84 (78%) respondents and exenteration was preferred by 14 (13%) respondents.

46 (42%) respondents never performed sentinel lymph node biopsy (SLNB), while 3 (3%) performed SLNB in all of their cases. The remaining respondents performed SLNB in selected cases. Among those who performed SLNB, 26 (24%) performed SLNB in patients with stage AJCC 7th edition TNM criteria T2b SC (greater than 10 mm).

In locally advanced non-metastatic SC, 53 (51%) respondents preferred surgical excision combined with adjuvant treatment. Among the neo-adjuvant agents used in globe preserving surgical excision for locally advanced SC, 21 (21%) respondents preferred MMC. For recurrent disease, 50 (48%) preferred surgical excision with adjuvant

Table 2 Practice patterns and preferences in management of sebaceous carcinoma

	<i>N</i>	Percentage (%)
Q8. In the cases of SC, what is your preferred technique of initial biopsy (tick as many as applicable)?		
Respondents/total responses	112/135	
Incisional biopsy	74	55
Shave excisional biopsy	3	2
Full thickness excisional biopsy	47	35
Punch biopsy	5	4
Frozen section	4	3
FNAC	1	1
Conjunctival map biopsy	1	1
Q9. Which of the following do you routinely perform for workup for localized SC (tick as many as applicable)?		
Respondents/total responses	112/304	
Blood taking	47	16
Radiological imaging	81	27
Lymph node palpation	106	35
Abdominal examination	30	10
Chest examination	36	12
Refer to oncologist for work up	2	1
Others	2	1
Q10. What imaging modality do you most commonly use on initial diagnosis of clinically localized SC <10 mm (tick as many as applicable)		
Respondents/total responses	110/222	
Chest X-ray	40	18
CT orbit	38	17
MRI orbit	26	12
CT head	5	2
MRI head	6	3
CT head and neck	13	6
MRI head and neck	5	2
Ultrasound of regional lymph nodes (parotid and submandibular lymph nodes) with FNA as needed	22	10
Ultrasound liver	16	7
CT liver	4	2
Whole body PET CT scan	18	8
CT chest	0	0
None	26	12
Others	3	1
Q11. What imaging modality do you most commonly use on initial diagnosis of clinically localized SC >10 mm (tick as many as applicable)		
Respondents/total responses	111/300	
Chest X-ray	45	16
CT orbit	53	19
MRI orbit	37	13
CT head	6	2

Table 2 (continued)

	<i>N</i>	Percentage (%)
MRI head	8	3
CT head and neck	21	8
MRI head and neck	20	7
Ultrasound of regional lymph nodes (parotid and submandibular lymph nodes) with FNA as needed	31	11
Ultrasound liver	27	10
CT liver	7	3
Whole body PET CT scan	38	14
CT chest	1	0
None	4	2
Others	2	1
Q12. In cases of SC, when do you perform conjunctival map biopsies? (tick as many as applicable)		
Respondents/total responses	111/274	
Suspicious of pagetoid involvement of conjunctiva	82	30
Recurrent disease	56	20
Upper and lower eyelid involvement	52	19
Orbital spread	29	11
Large tumor size	40	15
Never	11	4
Always	3	1
Others	1	0
Q13. What size margin do you usually excise for SC?		
Total responses	111	
3 mm	20	18
4 mm	19	17
5 mm	30	27
6 mm	4	4
>6 mm	2	2
According to frozen section findings	36	32
SD	12.41	
Q14. Which is your preferred method of assessment of margin involvement after excision?		
Total responses	111	
Send specimen for frozen section by pathologist	63	57
En face frozen section	7	6
Moh's micrographic surgery	20	18
Permanent section with subsequent eyelid reconstruction	15	14
Rapid paraffin section	5	5
SD	20.4	
Q15. In upper eyelid reconstruction after wide excision, which of the following is your preferred choice for posterior lamellar reconstruction?		
Total responses	110	
Lid sharing procedure	51	46

Table 2 (continued)

	<i>N</i>	Percentage (%)
Graft from fellow eyelid	24	22
Graft from distal sites (i.e., hard palate, ear cartilage, etc.)	27	25
Synthetic graft	3	3
Scleral graft	2	2
Others	3	3
Q16. In lower eyelid reconstruction after wide excision, which of the following is your preferred choice for posterior lamellar reconstruction?		
Total responses	107	
Lid sharing procedure	59	55
Graft from fellow eyelid	12	11
Graft from distal sites (i.e., hard palate, ear cartilage, etc.)	27	25
Synthetic graft	2	2
Scleral graft	3	3
Others	4	4
SD	18.83	
Q17. When do you use adjuvant treatment? (tick as many as applicable)		
Respondents/total responses	110/313	
Pagetoid involvement of conjunctiva	63	20
Recurrent disease	51	16
Upper and lower eyelid involvement	26	8
Positive margins after surgery	71	23
Orbital spread	67	21
Large tumor size	25	8
Lymph node metastasis	2	1
Never	6	2
Others	2	1
Q18. Which adjuvant do you commonly use?		
Total responses	104	
Topical Mitomycin C	39	38
Cryotherapy	15	14
Radiotherapy	44	42
Chemotherapy	1	1
Refer to oncologist/cancer unit	4	4
Others	1	1
SD	15.92	
Q19. For mitomycin C, what is your regimen of choice?		
Total responses	105	
0.04% Mitomycin-C four times daily for a week followed by one week off in one cycle	50	48
Others	3	3
Not applicable	52	50
SD	22.64	

Table 2 (continued)

	<i>N</i>	Percentage (%)
Q20. On average, how many cycles for mitomycin C do you use? (e.g., one cycle = one week on and one week off)		
Total responses	106	
One	6	6
Two	10	9
Three	10	9
Four	22	21
More than four	2	2
Not applicable	56	53
SD	18.2	
Q21. In cases with pagetoid spread (intraepithelial neoplasia) without metastasis, what is your preferred primary treatment?		
Total responses	108	
Wide local excision combined with adjuvant therapy	84	78
Exenteration	14	13
Topical chemotherapy and close observation	8	7
Wide excision only	2	2
SD	31.93	
Q22. When do you treat eyelid SC with radiotherapy as primary treatment? (tick as many as applicable)		
Respondents/total responses	109/224	
Patient refuses surgery	55	25
Patient is surgically unfit	59	26
As palliative treatment in advanced disease	62	28
Lack of surgical support	14	6
As neo-adjuvant treatment before surgery	10	5
Surgeon's preference	5	2
Never	19	9
Q23. When do you perform sentinel lymph node biopsy (SLN Bx)?		
Total responses	109	
All cases	3	3
Size >5 mm	10	9
Size >10 mm	26	24
Size >20 mm	17	16
When there is palpable lymph nodes	1	1
Imaging shows lymph node involvement	3	3
Never	46	42
Others	3	3
Q24. In cases with regional nodal metastasis without distant metastasis, what is your preferred treatment?		
Total responses	105	
Lymph node dissection alone	9	9
Others	51	49

Table 2 (continued)

	<i>N</i>	Percentage (%)
Lymph node dissection followed by radiotherapy if indicated		
Lymph node dissection combined with chemotherapy	21	20
Chemotherapy alone	2	2
Radiotherapy alone	2	2
Combined chemotherapy and radiotherapy	13	12
Refer to other specialist	7	7
SD	15.92	
Q25. In locally advanced non-metastatic SC, which is your preferred primary treatment modality?		
Total responses	105	
Surgical excision combined with adjuvant treatment	53	51
Neoadjuvant chemotherapy followed by surgery	12	11
Exenteration	40	38
SD	17.11	
Q26. Which neo-adjuvant agent do you use for globe preserving surgical excision in cases of locally advanced SC? (tick as many as applicable)		
Respondents/total responses	101/102	
Cisplatin	9	9
Carboplatin	4	4
5-Fluorouracil	9	9
Docetaxel	0	0
Mitomycin-C	21	21
Hormonal therapy	0	0
Do not use	47	46
Decided by oncologist	12	12
SD	14.57	
Q27. In cases requiring exenteration, what is your preferred technique?		
Total responses	104	
Skin sparing approach (if skin not involved)	21	20
Total exenteration	26	25
Subtotal exenteration	10	10
Depends on extent of disease	47	45
Other	0	0
SD	15.89	
Q28. In cases requiring exenteration, what is your preferred technique for wound closure?		
Healing by granulation	41	39
Skin graft	16	15
Local skin flap	9	9
Depends on extent of disease and need for post-operative radiotherapy	37	35

Table 2 (continued)

	<i>N</i>	Percentage (%)
Synthetic material	2	2
Total	105	
SD	15.17	
Q29. In cases with widespread non-metastatic disease requiring exenteration, which is your preferred treatment after exenteration?		
Total responses	104	
Radiotherapy	30	29
Chemotherapy	4	4
Both	13	13
Depending on specimen findings after exenteration	55	53
Decided by oncologist	2	2
SD	19.75	
Q30. In patients with recurrent disease, which is your preferred treatment?		
Total responses	105	
Neoadjuvant treatment followed by surgical excision	8	8
Surgical excision with adjuvant treatment	50	48
Surgical excision alone	2	2
Exenteration alone	10	10
Exenteration combined with radiotherapy	24	23
Exenteration combined with chemotherapy	8	8
Other	3	3
SD	15.72	
Q31. In patients with localized SC who are not fit for surgery or refuse surgery, what is your primary management?		
Total responses	106	
Radiotherapy	70	66
Chemotherapy	13	12
Cryotherapy	15	14
Observe	4	4
Others	4	4
SD	24.81	

therapy and 24 (23%) preferred exenteration combined with radiotherapy.

Outcomes

See Table 3, Q.32–34. According to their experience, 42 (40%) respondents estimated a recurrence rate of less than 10% in patients with localized SC. 52 (50%) of respondents estimated the overall mortality rate from SC as less than 5%. 62 (61%) of respondents selected distant metastatic disease as the most common cause of death in patients with SC.

Table 3 Results and outcomes based on personal experience

	<i>N</i>	Percentage (%)
Q32. From your experience, what is the approximate recurrence rate of localized SC?		
Total responses	105	
<10%	42	40
10–20%	30	28
20–30%	10	9
30–40%	6	6
>40%	2	2
Not sure	15	14
SD	14.09	
Q33. From your experience, what is the approximate overall mortality rate from SC?		
Total responses	104	
<5%	52	50
5–10%	19	18
10–20%	6	6
>20%	5	5
Not sure	22	21
SD	17.01	
Q34. From your experience, what is the main cause of death in your patients with SC?		
Total responses	101	
Localized disease	1	1
Regional metastatic disease	9	9
Distant metastatic disease	62	61
Side effects of treatment	1	1
Other cases (such as medical comorbidities)	28	28
SD	23.11	

Follow-up

See Table 4, Q.35–37. From our survey, 65 (64%) respondents routinely referred patients for assessment by a medical oncologist and 37 (36%) did not. 38 (37%) of respondents used physical examination alone during surveillance. 75 (74%) of respondents reported that long-term surveillance for local control was carried out by oculoplastic surgeons.

Discussion

Consistent with the well-known higher incidence of SC in the Asia Pacific countries [1, 5, 11, 12], many of our respondents seem to be more experienced in managing SC compared with the average non-Asian oculoplastic surgeon and up to 24% have managed more than 40 cases in their career so far.

In keeping with previous studies in the Asia Pacific population, the main presenting symptom of SC as reported

Table 4 Practice patterns in follow-up care and surveillance of sebaceous carcinoma

	<i>N</i>	Percentage (%)
Q35. Do you routinely refer patients with SC for oncologist assessment?		
Total responses	102	
Yes	65	64
No	37	36
SD	14	
Q36. Which investigation do you perform after surgery during surveillance?		
Total responses	103	
CT scan	27	26
MRI	29	28
Ultrasound	6	6
Physical exam alone	38	37
PET CT scan	2	2
Other	1	1
SD	12.22	
Q37. For the majority of stable cases, long-term surveillance is done by		
Total responses	102	
Oculoplastic surgeon	75	74
General ophthalmologist	10	10
Oncologist	16	16
Primary care physician	1	1
SD	29.07	

by our respondents was a solitary eyelid nodule (36%) [13–15]. Diffuse eyelid thickening mimicking blephar-conjunctivitis was reported by 13% of our respondents, which is less than the Caucasian population [16, 17]. Since nodular presentation such as recurrent chalazion is more common, incisional biopsy together with incision and curettage is commonly performed. This could explain why our respondents most commonly performed incisional biopsy (55%) followed by full thickness excisional biopsy (35%). This is different from a recently published British cohort in which primary excisional biopsy was the most commonly performed diagnostic intervention (42%) followed by incisional wedge biopsy (33%) [18].

We found there was no consensus amongst respondents on the investigative modality used for disease staging. More respondents chose CT orbit over MRI orbit, perhaps due to the availability and affordability of CT over MRI. Some series suggest map biopsies for all cases because even in solitary nodular SC with no conjunctival involvement clinically, half had biopsy-proven conjunctival involvement [19]. Others perform map biopsy only if there is clinical suspicion of diffuse palpebral and bulbar conjunctival involvement [20]. Our respondents performed conjunctival map biopsy in selected cases, most commonly

those with clinical signs suggestive of pagetoid involvement of conjunctiva (30%), recurrent disease (20%), and both upper and lower eyelid involvement (19%). Sa et al. [9] carried out a retrospective study of predominantly White and Hispanic subjects in the US and found among the 100 patients diagnosed with SC, 31 patients had intraepithelial neoplasia and this finding was mostly based on evaluation of the surgical specimen rather than conjunctival map biopsies; these authors advocate for conjunctival map biopsies only in selected patients who have clinically suspicious signs of involvement of conjunctiva adjacent to the main tumor. Yoon et al. [15] found only 8.3% of their Korean patients with SC had pagetoid spread. SC may behave differently in terms of its clinical presentation and tendency for pagetoid spread between different ethnicities.

We found that most respondents rely on physical examination as the main method for the detection of lymph node metastasis. For lesions greater than 10 mm, 24% of respondents would perform SLNB and 9% would perform SLNB for lesions greater than 5 mm. The relatively low percentage of SLNB performed in the Asia Pacific region may be related to the lack of technical expertise at certain centres and it may also be due to the fact that SLNB is logistically time consuming to set up. Among our respondents, 10% and 11% of respondents would evaluate regional lymph nodes with ultrasonography and perform fine needle aspiration as needed in lesions less than 10 mm and greater than 10 mm, respectively. Ultrasonography is a relatively inexpensive and accurate way of assessing for nodal involvement [21] and can be considered if SLNB is not available. Since SC metastasize to regional and systemic lymph nodes, ultrasonography of parotid, submandibular and cervical lymph nodes, and SLNB have been suggested as a way to evaluate regional lymph nodes to rule out metastasis. Studies have demonstrated that tumors larger than 10 mm correlate with nodal metastasis and this can occur in up to 18% [14, 16, 21]. Watanabe et al. [13] found that even tumors less than 5 mm can be associated with regional nodal metastasis among their Japanese cohort. Routine SLNB requires special expertise and can yield false negative results early in the learning curve, but the accuracy of SLNB for eyelid tumors has improved considerably in the past decade [22, 23]. The overall SLNB positivity rate was reported at 13% by the MD Anderson Cancer Center and all cases with positive SLNB had SC lesions greater than 10 mm [23, 24]. In a large series of 51 eyelid and conjunctival melanomas, 30% of patients with eyelid melanoma had positive SLNB [22]. This highlights the importance of SLNB in ocular adnexal malignancies.

According to our survey, the majority of responders (32%) utilized frozen section to determine the size of excision margin with 27% using a 5 mm clinical excision margin. This is consistent with previous studies using an

excision margin of 5 mm [14]. To assess for margin involvement, frozen section is the most commonly employed technique (57%) followed by Mohs micrographic surgery (18%). Most oculoplastic surgeons use a similar technique and principle to Mohs surgery in the eyelid area but removing the main tumor specimen as a full thickness “wedge” resection and then taking small en-face (adjacent) margins next to the main tumor specimen until negative margins are achieved. Our survey respondents used Mohs surgery more frequently than the British cohort, in which only 8% utilized Mohs surgery [18]. Mohs surgery, in common with all techniques that use frozen section evaluation of margins carries the risk of missing intraepithelial pagetoid spread and skip lesions [25]. The long-term benefits of Mohs surgery compared with other techniques is still unknown [26]. Full-thickness en-face frozen section has also been shown to be effective with comparable results to Mohs surgery for basal cell carcinoma [27, 28]. In a recent report from MD Anderson Cancer Center, using complete surgical excision of SC with en-face margin evaluation on frozen section, the local recurrence rate was only 6% [9]. In 4 of the 6 patients who experienced local recurrence in this 100-patient cohort, the surgeon had knowingly left a microscopically positive margin in an effort to avoid an orbital exenteration and MMC was given instead. This suggests that frozen section control using en-face margins can yield comparable results to Mohs surgery [29]. Despite not being commonly employed by our respondents, local resection with rapid paraffin section analysis has been employed in some studies and offered low recurrence rates with good cosmetic outcome. Its advantage is that paraffin sections may be more reliable than frozen sections for detection of intraepithelial pagetoid spread and margin evaluation according to some reports [30].

In our survey, radiotherapy, topical MMC, and cryotherapy were the most preferred adjuvant therapies (42%, 38%, and 14%, respectively). Shields et al. used cryotherapy after local excision in 68% of their patients and report a recurrence rate of 18% [16]. The use of MMC was adopted by 47% of our respondents. The most common regimen used was 0.04% Mitomycin-C four times daily for a week followed by one week off in one cycle used for four cycles. This is similar to the regimen used by Shields et al. [31] for patients with proven pagetoid involvement of the conjunctiva. Chemotherapy combined with surgical excision may be used in cases with extensive disease, nodal involvement, metastasis and occasionally in recurrent cases [32]. However, 46% of our respondents do not use neo-adjuvant chemotherapy for globe-preservation in locally advanced SC. Neo-adjuvant chemotherapy such as 5-fluorouracil and cisplatin may have a role in downstaging disease and avoiding more radical surgery, but current evidence is mostly limited to case reports and small case series [33, 34].

Based on their experience, the majority of our respondents report a recurrence rate of under 20% and a mortality rate of under 10%, with distant metastatic disease as the most common cause of death. This appears to be in keeping with other studies [9, 10, 14, 16]. Our survey suggests that most practitioners prefer a multidisciplinary approach in managing patients with SC, with up to 64% of surgeons routinely referring patients for assessment by an oncologist.

Our study is the first study to date to analyze the various practice patterns of oculoplastic surgeons in the Asia Pacific region. Limitations of this study include the nature of survey, which relies on the surgeon's impressions and estimation of events, rather than actual surgical outcomes. There is a definite possibility of selection and recall bias.

SC can have variable clinical presentations and may also behave differently in different ethnicities, explaining the variation in practice and management. Our survey highlights some differences in practice patterns in the Asia Pacific region compared with other populations. In particular, SC favors a nodular presentation in the Asia Pacific region. Initial diagnostic intervention and approach to conjunctival map biopsy may be different. We also found that SLNB is less commonly performed, possibly due to lack of access and expertise.

Summary

What was known before

- Sebaceous carcinoma has variable clinical presentations and management practices can vary greatly between surgeons and institutions.
- Mainstay treatment includes excision with adequate margins, radiotherapy, cryotherapy, and topical chemotherapy.

What this study adds

- This study explores the practice patterns of surgeons in Asia Pacific and how this compares with other populations.
- Incisional biopsy is commonly performed, conjunctival map biopsies are performed in selected cases, while Mohs micrographic surgery and sentinel lymph node biopsy are less widely available.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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