International Surgery Journal
Page DW et al. Int Surg J. 2021 Mar;8(3):776-779
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20210516

Original Research Article

A retrospective study to assess the influence of anaesthetic type on incomplete excision rate for non-melanoma skin cancers

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Received: 17 January 2021
Revised: 04 February 2021
Accepted: 08 February 2021

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ABSTRACT

Background: Australia has the highest incidence of non-melanoma skin cancers (NMSC) in the world estimated to be 2448/100,000 population with the state of Queensland carrying the highest burden of disease. Surgical excision is the primary treatment and makes up a large proportion of general surgical lists in regional Queensland where they are typically removed using either local anaesthetic (LA) alone, local anaesthetic and sedation (LAS), or general anaesthesia (GA). There is little in the literature to suggest if anaesthetic type effects the rate of incomplete excision. The purpose of this study is to establish if anaesthetic type impacts the rate of incomplete excision of NMSC.
Methods: A retrospective audit was performed, incorporating a total of 194 squamous and basal cell carcinoma lesions excised between October 2019 and October 2020 at two hospitals in regional Queensland, Australia. Data was recorded for the type of anaesthetic used and the histopathology of the lesions including type of lesion and clearance of microscopic margins.
Results: Of the 194 excised lesions 39 of them had involved margins (20.1%). The rate of involved margins under LA, GA and LAS were found to be 19.79, 18.52 and 22.73% respectively. When comparing these modalities with each other: LA vs. GA, LAS vs. GA and LA vs. LAS no significant difference was found in the rate of incomplete excision of NMSC with p values (<0.05) of 1, 0.62 and 0.82 respectively.
Conclusions: Modality of anaesthetic used for excision of NMSC does not affect the outcome of incomplete excision of NMSC.

Keywords: None-melanoma skin cancer, Management, Excision, Margins, Anaesthetic

INTRODUCTION

Non-melanoma skin cancers (NMSC) are the most common cancers in Australia and are predominantly composed of basal cell carcinoma (BCC) accounting for 70% and squamous cell carcinoma (SCC) accounting for 30% of NMSC.[1] Australia has the highest rates of skin cancer in the world with two thirds of the Australian population been diagnosed with a skin cancer before the age of 70, this likely pertains to a large Caucasian population with high UV light exposure year-round.[2]

NMSC are predominantly managed surgically with methods been divided into destructive techniques such as cautery and cryotherapies, and non-destructive surgical excision, the latter been considered the mainstay of treatment. This involves wide local excision of the lesion with a macro and microscopic healthy cuff of tissue that is described as having clear margins.[3] Typically these procedures are performed using some form of anaesthetic, typically; local anaesthetic alone (LA), local anaesthetic and sedation (LAS) or general anaesthetic (GA).

Clear surgical margins are an important determinant of long-term outcome of NMSC. There is a lack of international consensus on exactly what margins should be, however for low risk BCC's most guidelines state macroscopic surgical margins should be 3-4 and >5 mm for lesions with higher risk characteristics. For well differentiated BCC a microscopic margin of ≥0.5 mm is considered clear. For low-risk SCC's most guidelines recommend macroscopic margins to be 4 and 5-10 mm for SCC's with high-risk characteristics. Exact guidance on microscopic margins for SCC are not fully determined but for well differentiated lesions a microscopic margin ≥1 mm is usually considered adequate.[4,5]

Surgically excised BCC's with clear margins infers a long-term recurrence rate of 1% compared with an incomplete excision that infers a long-term recurrence rate of 31-41%.[3] Data on the recurrence of SCC's with involved margins is scant in the literature, and this likely relates to the fact that incompletely excised SCC's are always re-excised, compared with BCC's where observation for recurrence is often adopted in the absence of high-risk features over re-excision. High rates of re-excisions cause greater morbidity to patients and cost to a healthcare service. Given these issues, it is important to establish factors that contribute to involved margins and mitigate them as much as possible.

Multiple studies have been performed looking at various factors that contribute to incomplete excisions on NMSC, with the strongest predictor for incomplete excision of a NMSC been its anatomical location. Other factors include macroscopic margins used, patient age, patient sex, speciality of the operator and seniority of the operator.[6,7] There is scant evidence to suggest if the type of anaesthetic used to facilitate excision contributes to involved margins.

The purpose of this study was to establish if there is any evidence that the type of anaesthetic used for excision of NMSC contributes to the rate of incomplete excision.

METHODS

We performed a retrospective data collection over a 12-month period between 1st October 2019 and 1st October 2020 across two regional hospitals in Queensland Australia. A patient list was generated from operating theatre elective booking records of all patients who had skin lesions excised over this period. This included the procedural booking codes 31205-00, 31235-00, 31230-01, 31235-03, and 31230-02. Data points collected for each patient were age, sex, type of anaesthetic used, anatomical location of lesion, histological type of excised lesion and marginal clearance.

The three modalities of anaesthetic used in these two centres are local anaesthetic alone (LA), local anaesthetic and procedural sedation (LAS), or general anaesthetic (GA). General anaesthetic is almost always combined with local anaesthetic also. The margin of clearance in mm was not recorded, only if the histological report stated if it was clear or involved.

Exclusion criteria for this study were: all lesions that were not NMSC, lesions undergoing re-excision and lesions that had been excised at the same time as another procedure.

Data was collected from a total of 251 patients, following exclusion criteria a total of 194 NMSC lesions across this population were included in the study. Lesions were then divided into groups based on anaesthetic used: LA, LAS, and GA, then further subdivided into groups of BCC and SCC and finally into groups based on anatomical location of the lesions.

Data was then analysed using Fischer exact and Chi-squared tests with p value of 0.05. Comparisons were made comparing each modality of anaesthetic with one another for BCC, SCC and all NMSC.

Ethics approval was gained with an approval using a low and negligible risk research pathway.

RESULTS

Across a 12-month period a population of 251 patients were identified to have had skin lesions excised in the operating theatre across the two hospital sites. Of this population a total 194 NMSC were removed, 133 of these were BCC's and 61 were SCC's. Lesions were divided into groups based on type of anaesthetic used to excise them and the histology of lesion, SCC vs BCC. They were then further subdivided into anatomical location as per Tables 1-3.

Table 1: Data for lesions excised under local anaesthetic only.

Lesion histology	Anatomical location	No.	Involved margins
BCC	Scalp	0	0
	Face	42	12
	Torso	8	0
	Arm	10	2
	Leg	15	4
Total incomplete excisions 18/75 (24%)			
SCC	Scalp	1	0
	Face	7	1
	Torso	2	0
	Arm	7	0
	Leg	4	0
Total incomplete excisions 1/21 (4.8%)			

Lesions excised under local anaesthetic only

A total of 96 lesions were excised under LA only. Of these 75 were BCC's and 18 were reported as having

involved margins. The remaining 21 lesions were SCC's, 1 of which had an involved margin. When excising lesions using LA only, the incomplete excision rate for BCC's was 24%, and for SCC's was 4.8% and overall, for NMSC 19.8%.

Table 2: Data for lesions excised under local anaesthetic and sedation.

Lesion histology	Anatomical location	N	Involved margins
BCC	Scalp	2	0
	Face	19	4
	Torso	0	0
	Arm	1	0
	Leg	3	0
Total incomplete excisions 4/25 (16%)			
SCC	Scalp	2	0
	Face	15	6 (3 on ear)
	Torso	1	0
	Arm	2	0
	Leg	1	0
Total incomplete excisions 6/19 (31.6%)			

Table 3: Data for lesions excised under general anaesthetic.

Lesion histology	Anatomical location	No.	Involved margins
BCC	Scalp	0	0
	Face	28	7
	Torso	0	0
	Arm	2	1
	Leg	3	0
Total incomplete excisions 8/33 (24.2%)			
SCC	Scalp	6	0
	Face	3	1
	Torso	1	0
	Arm	4	0
	Leg	7	1
Total incomplete excisions 2/21 (9.5%)			

Lesions excised under local anaesthetic and sedation

A total of 44 lesions were excised under LAS. Of these 25 were BCC's and 4 were reported as having involved margins. The remaining 19 lesions were SCC's, 6 of which had involved margins. When excising lesions using LAS the incomplete excision rate for BCC's was 16%, and for SCC's was 31.5% and overall, for NMSC 22.7%.

Lesions excised under general anaesthetic

A total of 54 lesions were excised under GA. Of these 33 were BCC's and 8 were reported as having involved margins. The remaining 21 lesions were SCC's, 2 of which had involved margins. When excising lesions using GA the incomplete excision rate for BCC's was 24.2%, and for SCC's was 9.5% and overall, for NMSC 18.5%.

Group comparisons

Using Fischer's exact test and then Chi-squared analysis with significance level of <0.05 we compared groups looking for significant difference of incomplete excision rate between lesions excised using different anaesthetic type. The comparisons were LA vs LAS, LA vs GA, and LAS vs GA, each of these comparisons was made for BCC, SCC and NMSC overall. The results of these are in Table 4.

Table 4: Summary of results of Fischer exact test and Chi squared analysis when comparing excision rates for NMSC.

Comparison	P (0.05)	Statistical significance
LA vs LAS for BCC	0.58	Nil
LA vs LAS for SCC	0.04	Significant
LA vs LAS for all NMSC	0.82	Nil
LA vs GA for BCC	1	Nil
LA vs GA for SCC	1	Nil
LA vs GA for all NMSC	1	Nil
LAS vs GA for BCC	0.53	Nil
LAS vs GA for SCC	0.12	Nil
LAS vs GA for all NMSC	0.62	Nil

It was found that the type of anaesthetic used to excise NMSC resulted in no significant difference in the rate of incomplete excision of lesions except for comparing LA vs LAS in the excision of SCC's which resulted in a statistically significant difference with a p value of 0.04.

DISCUSSION

These results demonstrate that overall, the type of anaesthetic used to facilitate the excision of NMSC's has no influence on the rate of incomplete excision. However, in our subgroup analysis when comparing the excision of SCC's using LA vs LAS it was found that the incomplete excision rate when using LAS was significantly higher compared with LA.

This subgroup finding is likely explained due to the influence of the anatomical locations of the lesions in the groups. On further review it was noted that in the excision of SCC's, the LAS group had 5/21 (24%) of lesions excised from the ear, 4 of which had involved margins. Compared with the LA group only 1/21 (4.8%) of SCC's were excised from the ear and that single case had involved margins. It is known from previous studies that anatomical location has the strongest influence on the rate of incomplete excision with one large study showing an incomplete excision rate of SCC's on the ear to be 18.1%.[7] Given the higher number of ear lesions in the LAS group it would be expected the incomplete excision

rate would be higher in this group and is accounted for by anatomy rather than anaesthetic type.

Overall incomplete excision rate of all NMSC across these two centres was 20.1% across this 12-month period. It is difficult to say if this is a comparable rate with other similar centres. Previous published studies report incomplete excision rates of NMSC between 2.3% and 26%.[7-9] There are varying factors that influence this rate including physician type, physician grade and geographical location likely influences this rate also.[6]

This study is limited by the sample size of only 194 lesions included in the study and when divided into groups based on anaesthetic type and specific type of lesion the groups become relatively small samples which can lead to skew results, which is what we believe is seen in the LA vs LAS for SCC. This can be mitigated by using a larger sample group by either including other institutions or collecting participants over a longer duration. Another limitation is knowing the level of the primary operator i.e., Consultant or registrar, the notes in the institutions this study was performed in documents who is present in the operation but not who is the primary operator and for the vast majority of cases both a consultant and registrar are present and therefore documented in the operation. We know from previous studies such as Talbot et al that this can be a source for confounding.[8]

CONCLUSION

This study demonstrated that the type of anaesthetic (LA, LAS, or GA) used to facilitate the excision of NMSC had no significant influence on the rate of the incomplete excision of lesions. With one exception in a subgroup analysis, we found there was a significant difference when excising SCC's using LAS compared with LA, where LAS was associated with a greater number of incomplete excisions. We believe this is a skewed result relating to more cases in the LAS group having lesions excised from the ear compared with LA group. And this high-risk anatomical area for incomplete excision explains the skew. We believe a further study with a larger study population would likely eliminate this artefact.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Cancer Council. Skin Cancer in Australia Fact Sheet. Available at https://actcancer.org/prevention/sunsmart/skin-cancer-in-australia. Accessed 05 January 2021.
2. Staples MP, Elwood M, Burton RC, Williams JL, Marks R, Giles GG. Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985. Med J Aust. 2006;184(1):6-10.
3. Nolan GS, Wormald JCR, Kiely AL, Totty JP, Jain A. Global incidence of incomplete surgical excision in adult patients with nonmelanoma skin cancer: study protocol for a systematic review and meta-analysis of observational studies. Syst Rev. 2020;9:83.
4. Cancer Care Guideline. Optimal care pathway for people with basal cell carcinoma or squamous cell carcinoma. Available at https://www.cancer.org.au/assets/pdf/basal-cell-carcinoma-or-squamous-cell-carcinoma-optimal-cancer-care-pathway. Accessed 05 January 2021.
5. Nahhas AF, Scarbrough CA, Trotter S. A Review of the Global Guidelines on Surgical Margins for Nonmelanoma Skin Cancers. J Clin Aesthet Dermatol. 2017;10(4):37-46.
6. Hansen C, Wilkinson D, Hansen M, Soyer HP. Factors Contributing to Incomplete Excision of Nonmelanoma Skin Cancer by Australian General Practitioners. Arch Dermatol. 2009;145(11):1253-60.
7. Thomas DJ, King AR, Peat BG. Excision margins for nonmelanotic skin cancer. Plast Reconstr Surg. 2003;112(1):57-63.
8. Talbot S, Hitchcock B. Incomplete primary excision of cutaneous basal and squamous cell carcinomas in the Bay of Plenty. N Z Med J. 2004;117(1192):U848.
9. Dieu T, Macleod AM. Incomplete excision of basal cell carcinomas: a retrospective audit. ANZ J Surg. 2002;72(3):219-21.

Cite this article as: Page DW, Watter H, Ng GS, Silva M. A retrospective study to assess the influence of anaesthetic type on incomplete excision rate for non-melanoma skin cancers. Int Surg J 2021;8:776-9.