# A Meta-analysis Evaluating the Efficacy of Various Surgical Treatment Modalities on Melanomas

## Background

Treating periocular skin cancers is challenging due to the close proximity of the lesions to essential anatomical structures. Surgical options for periocular skin cancers include standard surgical excision (GSE), Mohs micrographic surgery (MMS), wide local excision (WLE) and frozen section evaluation (FSE). Currently, there is no randomized study comparing the efficacy of these surgical treatments on different types of periocular skin cancers.

## Methods

### **Types of Cancer** Analyzed

Basal Cell Carcinoma (BCC)

Squamous Cell Carcinoma (SCC)

Sebaceous Carcinoma

Other Non-Melanomas

Melanoma

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## Surgical Options Analyzed

Mohs Micrographic Surgery (MMS)

Wide Local Excision (WLE)

**Frozen Section** (FSE)

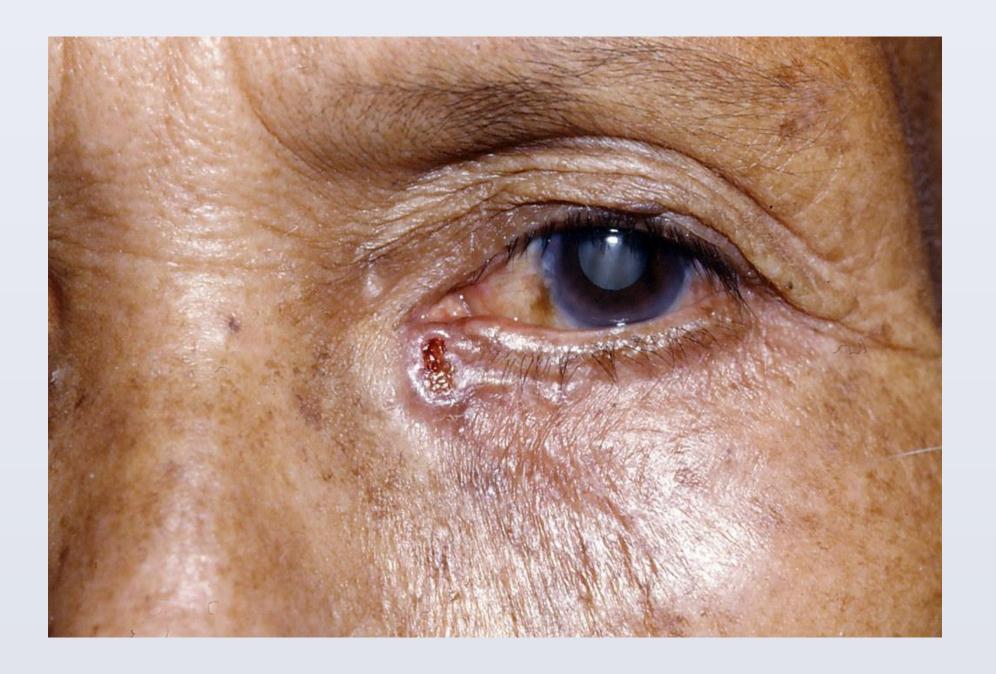
General Standard Excision (GSE)

Cryotherapy (CYT)

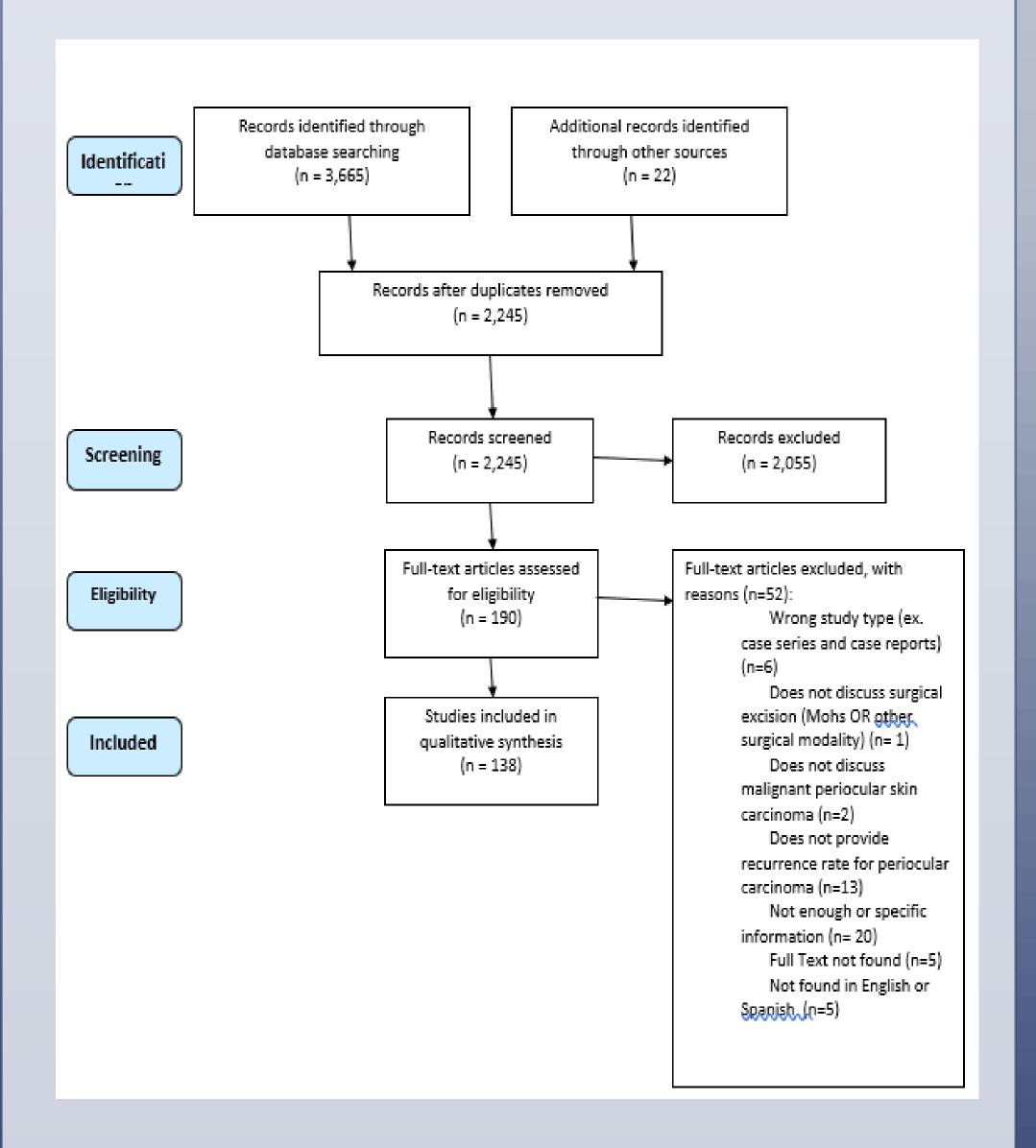
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## Methods

A meta-analysis was conducted, evaluating the recurrence rates of periocular skin cancers status-post surgical treatment. Subgroup analysis further compared results among surgical modality and skin cancer subtypes.







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## Results

For basal cell carcinoma, metaregression analysis of proportions showed that the recurrence rate for MMS was significantly lower compared to WLE (p<0.003); the recurrence rate for FSE was also significantly lower compared to WLE (p<0.001). For sebaceous carcinoma, the recurrence rate for MMS was also significantly lower compared to WLE (p<0.001). Meta-regression on squamous cell carcinoma also demonstrated significantly lower recurrence rates in MMS than that of FSE (p<0.001) and GSE (p=0.001).

	Experime	ntal	Contr	ol		Risk Ratio	Risk Ratio
ly or Subgroup	Events				Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Sebaceous Carci							
s 2017	0	5	0	4		Not estimable	
(a) 2014	11	26	6	11	36.8%	0.78 [0.38, 1.56]	
(b) 2014	1	34	1	26	3.6%	0.76 [0.05, 11.66]	
u 2019	18	115	97	245	59.5%	0.40 [0.25, 0.62]	<b>■</b>
total (95% CI)		180		286	<b>100.0</b> %	0.52 [0.31, 0.88]	•
l events	30		104				
erogeneity: Tau² = 0.07; Chi² = 2.81, df = 2 (P = 0.25); l² = 29% for overall effect: Z = 2.44 (P = 0.01)							
BCC: MMS vs GSE							
ams 2019	3	28	2	30	74.6%	1.61 [0.29, 8.92]	<b></b>
g 2002	0	6	2	113	25.4%	3.26 [0.17, 61.54]	
otal (95% CI)		34		143	<b>100.0</b> %	1.92 [0.44, 8.45]	
l events	3		4				
erogeneity: Tau² = 0 for overall effect: Z	-	-	= 1 (P =	0.68);	²=0%		
BCC: MMS vs FSE							
net 2006	0	19	4	85	51.0%	0.48 [0.03, 8.52]	<b>_</b> _
g 2002	Ő	6	2	97	49.0%	2.80 [0.15, 52.86]	
otal (95% CI)	-	25	-		100.0%	1.14 [0.15, 8.89]	
l events erogeneity: Tau² = 0 for overall effect: Z	-	-	6 = 1 (P =	0.38);	²=0%		
BCC: FSE vs GSE							
	0	16	0	27		Not octimoble	
lfin 1979 way 2004	0	16 31	0 0	37 114	29.6%	Not estimable 25.16 [1.33, 474.51]	
anas 1981	0	39	6	126	30.4%	0.24 [0.01, 4.24]	<b>_</b>
g 2002	2	97	2	113	39.9%	1.16 [0.17, 8.12]	
otal (95% CI)	-	183	-		100.0%	1.80 [0.17, 19.16]	
l events	5		8				
erogeneity: Tau² = 2 for overall effect: Z	-	-	= 2 (P =	0.08);	r²= 61%		
BCC: Cryotherapy	vs GSE						
ford 1982	1	5	18	96	57.0%	1.07 [0.18, 6.46]	
ires 2010	2	29	0	10	21.2%	1.83 [0.10, 35.26]	<b>_</b>
ams 2019	0	5	2	30	21.9%	1.03 [0.06, 18.93]	<b>_</b>
otal (95% CI)		39		136	100.0%	1.19 [0.30, 4.63]	-
l events	3		20				
erogeneity: Tau² = 0 for overall effect: Z			= 2 (P =	0.95);	r = 0%		
S Nonmelanoma Ca	rcinoma: I	MMS vs	WLE				
er 2017	0	10	0	10		Not estimable	
s 2017	0	5	Ō	4		Not estimable	
(a) 2014	11	26	6	11	29.6%	0.78 [0.38, 1.56]	
(b) 2014	1	34	1	26	2.7%	0.76 [0.05, 11.66]	
2015	6	79	9	104	17.5%	0.88 [0.33, 2.36]	
J 2019	18	115	97	245	50.1%	0.40 [0.25, 0.62]	
otal (95% CI)		269		400	100.0%	0.57 [0.36, 0.89]	-
l events	36 00:05/7-	2.00 46	113	0.071.1	7 - 2400		
erogeneity: Tau² = 0 for overall effect: Z	-	-	= 3 (P =	0.27);	r= 24%		
' Nonmelanoma Ca	ncinoma: I	MMS vs	GSE				
der Eerden 2010	6	795	7	709	65.0%	0.76 [0.26, 2.26]	
ams 2019	3	28	2	30	26.1%	1.61 [0.29, 8.92]	—_ <b> </b> ■
g 2002	0	6	2	113	8.9%	3.26 [0.17, 61.54]	
otal (95% CI)		829		852	100.0%	1.06 [0.44, 2.53]	-
l events	9		11				
erogeneity: Tau² = 0 for overall effect: Z	-	-	= 2 (P =	U.56);	r=0%		
							0.002 0.1 1 10 500

Our results showed that patients who underwent MMS had lower recurrence rates of sebaceous carcinoma or nonmelanomas compared to patients who underwent the WLE technique. Proportionally among all studies, MMS was also demonstrated to have significantly lower recurrence rates in basal cell carcinoma and sebaceous carcinoma compared to WLE; and lower compared to FSE and GSE in squamous cell carcinoma. Overall, these results illuminate that MMS is an excellent surgical technique for periocular cutaneous nonmelanomas. Further larger scale studies are needed to determine robust efficacy and guidelines for optimal surgical treatment and enhance patient outcomes. References

## Conclusions

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