

## **Supplementary Digital Content**

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eTABLE 1. Summary of Previously Reported Cases																	
Case No.	Year of Publication	Author	# of Cases	Age/Sex	Site	Clinical History and Appearance	Initial Clinical Impression/Suspicion	Type of Surgical Intervention	Syn	Chr	NSE	Estr	Prog	SMA or p63	No Invasive Mucinous Component	Invasive Mucinous Component	Recurrence/Follow-up
1	1997	Flieder A et al. [1]	2	60 F	LUL	Enlarging nodule	-	Resection	+	+	+	+	+			✓	N
2				75 F	RLL	Like BCC	BCC	Resection	foc+	foc+	+	+	+			✓	Y, 18 mo
3	2000	Belezza G et al. [2]	2	84 F	Scalp, nape of neck	Slow-growing, red-blue dome-shaped nodule	Cavernous hemangioma	Complete excision			+	+	foc+				N, 17 mo
4				71 F	Frontal scalp	Nodule with swelling	Cyst	Complete excision		+	+	+	+				N, 9 mo
5	2005	Tannous Z et al. [3]	1	79 M	RMC, RSLC, RN, RIO	Erythematous to violaceous nodules	-	Mohs	+		+	+	+				N, 24 mo
6	2005	Zembowicz A et al. [4]	12	79 M	Lower	Pigmented cyst	Mucinous cystadenocarcinoma	-								✓	N, 48 mo
7				60 F	Upper	-	Mucinous apocrine carcinoma	-	+	(-)	+	+	+			✓	N, 60 mo
8				71 F	Upper	History of resolved cystic lesion	Low-grade apocrine cystadocarcinoma with neuroendocrine differentiation	-	+	+	+	+	+			✓	N, 12 mo
9				76 F	Lower	-	EMPSGC	-			+	+	+			✓	N, 12 mo
10				74 F	Cheek	-	Papillary eccrine cystadenoma	-	+	+	+					✓	-
11				68 M	Cheek	-	Well-differentiated adenocarcinoma with mucin secretion	Curettage	+	+	+					✓	N, 12 mo
12				84 F	Lower	History of multiple cysts	Papillary mucinous endocrine carcinoma	-	+	+	+	+	+			✓	N, 12 mo
13				79 F	Lower	Poorly defined eyelid thickening with 4 lesions (2 cystic and 2 skin-colored, 1 of them translucent, pink-tan and revealed to be an EMPSGC)	Mucinous carcinoma hidrocystoma with focal carcinoma in situ EMPSGC hidrocystoma with papillary hyperplasia	Mohs	+	+	+	+	+			✓	N, 48 mo
14				61 M	Lower	Recurrent growth at site of previous biopsy (22 years ago)	Low-grade adnexal neoplasm with apocrine mucinous differentiation "apocrine adenoma"	-	+	(-)	(-)	+	+			✓	N
15				76 F	Lower	-	Eccrine hidrocystoma	-	+	+	+					✓	N, 24 mo
16				67 F	Lower	-	EMPSGC with area suspicious for invasive carcinoma	-	+	+	+	+	+			✓	-
17				48 M	Lower	-	Benign apocrine cystadenoma with atypia	-	+	(-)	(-)					✓	-
18	2006	Bulliard C et al. [5]	1	72 F	RLL	Small, flesh-colored lesion	-	Excisional biopsy	+	+	+	+	+			✓	N, 7 mo
19	2007	Emanuel PO et al. [6]	1	61 F	LLL	Solitary non tender lesion, pusatile on an erythematous base with a blue hue	Apocrine hidrocystoma	Excision	+	+	+	+	+			✓	Y, 36 mo
20	2008	Mehta S et al. [7]	1	70 F	LUL	Firm, bluish nodule	-	Excision		+	+						N, 6 mo
21	2010	Kim J et al. [8]	1	63 M	Right cheek	Asymptomatic nodule	-	Excision	+		+	+					N, 18 mo
22	2010	Chang S et al. [9]	1	51 M	LLL	Small flesh-colored nodule	-	Excision	+	+	+	+	+	p63+		✓	-
23	2012	Salim A et al. [10]	3	69 F	RMC	-	Cyst	-	+	+	+	+	+	p63-		✓	N, 46 mo
24				36 M	LLC	-	Cyst	-	+	+	+	+	+	p63-		✓	-
25				53 F	LLL	-	Cyst	-	+	+	+	+	+	p63-		✓	N, 42 mo
26	2012	Inozume T et al. [11]	1	55 M	Cheek	Subcutaneous tumor of the upper cheek		Excisional biopsy	+	(-)	+	+	+	SMA/ p63- and p63+		✓	N
27	2013	Koike T et al. [12]	1	74 M	LUL	Small flesh-colored nodule	Monomorphic adenoma, 3 previous recurrences	Excision	+	+	+	+	+			✓	N, 6 mo
28	2013	Hoguet et al.*** [13]	9	72 M	Lid	-	BCC vs. sweat duct carcinoma	-	(-)	(-)	+	+	+			✓	N, 8 mo
29				53 M	RUL	-	BCC	-	+	+	+	+	+			✓	N, 2 mo
30				70 F	RUL	Cystic	BCC vs. merkel cell carcinoma	-	+	+	+	+	+			✓	N, 12 mo
31				61 M	LUL	Well-circumscribed, no ulceration	-	(-)	(-)	+	+	+			✓	N, 18 mo	
32				78 F	RUL	Pedunculated, cystic	BCC	-	+	+	+	+	+			✓	Y, 36 mo
33				87 M	LLL	Well-circumscribed, vascularized	BCC	-	+	+	+	+	+			✓	N, 10 mo
34				66 F	LUL	-	Cyst/wart	-	(-)	(-)	+	+	+			✓	N, 8 mo
35				69 M	LUL	-	Atypical chalazion	-	+	(-)	+	+	+			✓	N, 8 mo

\*\*\*included in our 63-case series; Syn = synaptophysin, Chr = chromogranin, NSE = neuron-specific enolase, Estr = estrogen receptor, Prog = progesterone receptor; + = positive, foc+ = focally positive, (-) = negative; LUL= left upper lid, LLL = left lower lid, RLL = right lower lid, RUL = right upper lid; Lower = lower eyelid, Upper = upper eyelid; RMC = right medial canthus, RSLC = right superior lateral canthus, RN = right nasal sidewall, RIO = right infraorbital areas, RLC = right lateral canthus, LLC = left lateral canthus, LMC = left medial canthus; NOS = not otherwise specified; SCC = squamous cell carcinoma, DFSP = dermatofibrosarcoma protuberans

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Case No.	Year of Publication	Author	# of Cases	Age/Sex	Site	Clinical History and Appearance	Initial Clinical Impression/Suspicion	Type of Surgical Intervention	Syn	Chr	NSE	Estr	Prog	SMA or p63	No Invasive Mucinous Component	Invasive Mucinous Component	Recurrence/Follow-up	
36	2013	Dhaliwal C et al. [14]	2	61 F	LLL	Pearlescent lesion	Recurrence called nodular BCC	Excision	+	+	+	+	+	SMA+		✓	Y, 18 mo	
37				64 F	LUL	Cystic swelling	Sebaceous cyst and recurrence "nodular BCC"	Excision	+	+	+	+	+	p63-		✓	Y, 7 mo	
38	2014	Shon W & Salamao D [15]	13	66 M	RLL	Cystic nodule, hidrocystoma or other eccrine tumor	Hidadenoma	-	+	+		+	+		✓		N, 20 mo	
39				55 M	LLL	Cystic basal cell carcinoma or other eccrine tumor	Papillary hidradenoma	-	+	+		+	+		✓		-	
40				77 F	RLC	Pigmented lesion or other neoplasm	Hidradenoma	-	+	(-)		+	+		✓		N, 30 mo	
41				60 F	RLL	na	Hidradenoma	-		+					✓		-	
42				74 F	RLL	Sebaceous carcinoma	Nodular hidradenoma	-	+	+		+	+		✓		N, 94 mo	
43				65 F	LLL	Cyst	Mucinous carcinoma	-	+	+		+	+			✓	-	
44				51 M	RLL	Nodule, NOS	Clear cell hidradenoma	-	+	(-)		+	+		✓		-	
45				40 F	RLL	BCC	Nodular hidradenoma	-	(-)	+		+	+		✓		-	
46				67 M	Eyelid, NOS	Skin tag	EMPSGC	-	(-)	+		+	+		✓		-	
47				40 M	RMC	Lesion, NOS	Nodular hidradenoma	-	+	+		+	+		✓		-	
48				76 F	RUL	Sebaceous cyst	EMPSGC	-	+	+		+	+		✓		-	
49				60 F	LLL	Lesion, NOS	EMPSGC	-	+	+		+	+		✓		-	
50				65 F	LLL	na	EMPSGC	-	+	+		+	+		✓		-	
51	2014	Shimizu I et al. [16]	2	72 F	RLL	Pink papule	BCC	Mohs	+		+	+						-
52				74 M	LLL	Smooth, pink, umblicated papule	Keratoacanthoma vs. molluscum contagiosum	Excision	+		+	+						-
53	2015	Fernandez-Flores A & Cassarino S [17]	3	88 M	Left cheek	Pinkish nodule	Dermal multinodular tumor	Excision	+	+	+	+	+	SMA(foc+)				-
54				76 M	RUL	Lesion	-	-	+	+	+	+	+	SMA(foc+) /p63+				-
55				69 F	RUL	Nodule	-	-	+	+	+	+	+	SMA(foc+) /p63(foc+)				-
56	2015	Collinson A et al. [18]	1	78 F	LUL	Nodular mass with telangiectasia and madarosis	BCC	Mohs	foc+	foc+	+	+	+	p63(foc+)		✓	N, 8 mo	
57	2015	Turnbull L et al.*** [19]	2	62 M	LLL	Translucent papule	Benign adnexal tumor	Mohs	foc+	(-)	foc+	+	+		✓		-	
58				57 M	RLL	Asymptomatic papule	Mucinous carcinoma	Mohs	foc+	(-)	foc+	+	+		✓		-	
59	2015	Jedrych J et al. [20]	1	75 F	LLL	History of malignancy, asymptomatic non-ulcerated, slowly enlarging skin-colored nodule	Poorly differentiated carcinoma (metastasis)	-	foc+		+	+	+	p63+	✓		-	
60	2016	Bamberger M et al [21]	1	74 M	LLL margin	Papule with madarosis, telangiectasia, and distortion of eyelid margin architecture	Eccrine adenocarcinoma	Excisional biopsy	+		+	+	+	SMA+	✓		-	
61	2016	Abdulkader M et al. [22]	2	83 F	LUL			Excisional biopsy	+	+		+	+	SMA+/p63+	✓		N, 1 mo	
62				51 F	RUL	History of breast cancer; small, growing nodule that caused vision problems	-	Excisional biopsy	+	foc+		+	+		✓		N, 12 mo	
63	2016	Cornejo K et al. [23]	1	71 F	LUL	Skin colored papule	-	-	+	+	+	+	+	SMA-/p63-	✓		N, 1 mo	
64	2017	Lerias S et al. [24]	1	84 F	Lower	Papule	-	-	foc+	foc+		+	+		✓		-	
65	2017	Chou YH et al. [25]	2	87 M	Left cheek	Painless solitary nodule	Hidadenoma	Excisional biopsy	+		+	+	+	p63(foc+)		✓	N, 10 mo	
66				55 F	LUL	papule	-	Excision	+		+	+	+		✓		N, 4 mo	
67	2017	Westby E et al. [26]	1	71 F	Medial LUL	Non-ulcerated, non-tender, pink-to-red, shiny nodule	-	Mohs	+	+	+	+	+	p63+	✓		-	

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68	2017	Scott B et al. [27]	1	70 F	Lateral RUL	History of breast cancer 20 years ago; skin-colored, mobile, slightly firm papule	-	Mohs	+		+	+	+				-
69	2017	Ross A et al. [28]	1	29 F	Lateral RUL	Non-painful, raised, firm nodule adherent to the tarsus	Granuloma vs. epidermal inclusion cyst	Excision	foc+	(-)	+						-
70	2017	Brett MA et al. [29]	1	73 F	RUL	Pearly tan nodule	BCC	Excision	+	+	+	+	+	p63(foc+)	✓	N, 8 mo	
71	2018	Kawasaki T [30]	1	51 M	LUL	Mass	-	Excisional biopsy	+	+	+	+	+			-	
72	2018	Charles N et al. [31]	1	59 M	RUL	Firm, non-tender, painless nodule near the lateral canthus with focal madarosis	-	Wedge excision	+	+	+	+	+			-	
73	2018	Navrashina, K et al. [32]	1	81 F	Vertex scalp	Poorly demarcated, non-tender, bluish, translucent, lobulated nodule with telangiectasia	-	Mohs	+							-	
74	2018	Hasegawa-Murakami Y et al. [33]	1	78 M	Right temple	Small, red Yam-like nodule with a bloody crust; dermoscopy showed pink ovoid nests with a cobblestone appearance and some blue globules	-	Excision	foc+	foc+	+	+	+	p63-		N, 36 mo	
75	2018	Held L et al. [34]	11	68 F	Supra-auricular	-	Merkel cell carcinoma	-	+	+					✓	-	
76				64 F	Lower	Rule out BCC	Sebaceous gland carcinoma	-	+	+	+				✓	-	
77				62 M	Upper	-	EMPSGC	-	+	+	+	+			✓	-	
78				72 M	Lower	Rule out SCC or BCC	-	-	+	+	+	+			✓	-	
79				70 F	Lower	Bluish firm nodule for 9 mo, rule out DFSP	-	-	+	+	+	+			✓	-	
80				64 M	Cheek	Rule out dermatofibroma or dermal-based nevus	-	-	+	+	+	+			✓	-	
81				82 F	Ocipital	2 Adjacent translucent nodules	Adnexal carcinoma	-	+	+	+	+			✓	-	
82				84 M	Cheek	Rule out BCC	-	-	+	+	+	+			✓	-	
83				71 M	Lower	Rule out chalazion	Hidradenoma	-	+	(-)	+	+			✓	-	
84				61 M	Lower	Rule out cyst	Adnexal carcinoma	-	+	(-)	+	+			✓	-	
85				64 M	Retroauricular	-	-	-	+	+	+	+			✓	-	
86	2018	Qin H et al. [35]	11	60 M	RLL	-	Suspicious lesion	-	+	(-)	+					-	
87				56 F	RLL	-	Cyst or BCC	-	(-)	(-)	+	+				-	
88				76 F	LLL	-	LLL lesion	-	+	+	+	+				-	
89				85 F	LLL	-	Chalazion	-	+	(-)	+	+				-	
90				66 M	RUL	-	Fluid-filled mass or cyst	-	+	+	+	+				-	
91				56 F	LMC	-	LMC lesion	-	+	+	+	+				-	
92				63 F	LLL	-	LLL lesion	-	+	(-)	+	+				-	
93				60 F	LUL	-	Benign neoplasm of skin	-	+	+	+	+				-	
94				65 M	RLL	-	Hemangioma	-	+	+	+					-	
95				83 F	LLL	-	Basaloid tumor with glandular features	-	+	+	+	+				-	
96				57 F	RLL	-	Suspicious lesion	-	+	+	+	+				-	

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10 of 11  
EMPSGC  
cases were  
in situ-only  
lesions

1 of 11  
EMPSGC  
cases had  
an invasive  
component

**eTABLE 2.** Comparative Results, Age Analysis

	Collected EMPSGC Cases, n=63		Previously Reported EMPSGC Cases*, n=86		<b>p-value</b>
	Range (years)	Range (years)	Range (years)	Significant difference?	
Average Age (years)	64.2	47-87	67.2	29-88	
Women	65.9, n=42	52-84	68.4, n=55	29-85	
Men	60.9, n=21	47-87	65.1, n=33	36-88	
Significant difference?	Y		N		
p-value	p=0.03		p=0.22		
EMPSGC with Invasive Mucinous Component					
Average age (years)	66.7, n=21	52-84	64.7, n=21 <sup>◊</sup>	36-87	<b>p-value</b>
Women	68.9, n=13	58-84	65.5, n=14	51-79	
Men	63.3, n=8	52-72	62.6, n=7	36-87	
Significant difference?	N		N		
p-value	p=0.1		p=0.68		
EMPSGC - In Situ and/or Pushing Invasion					
Average age (years)	63, n=42	47-87	67.7, n=38 <sup>¶</sup>	40-84	<b>p-value</b>
Women	64.6, n=29	52-82	70.7, n=23	40-84	
Men	59.38, n=13	47-87	63.5, n=15	40-84	
Significant difference?	N		Y		
p-value	p=0.08		p=0.05		
Significant difference between average age of presentation in our cases with and without an invasive mucinous component?				N	p=0.10
Significant difference between average age of presentation in previously published cases with and without an invasive mucinous component?				N	p=0.28

\*Does not include 10 previously published cases (Hoguet et al. and Turnbull et al.)<sup>13,19</sup> included in our original data collection; see SDC eTable1

<sup>◊</sup>Calculated based on age information provided for 21/22 cases

<sup>¶</sup>Invasive status was available for 49 cases [in situ and/or pushing invasion] and 22 invasive cases (10 in situ cases<sup>35</sup> could not be included in this analysis due to limited information)

**eTABLE 3.** Site of Lesion Comparison

Zembowicz et al. EMPSGC <sup>®</sup> cases <sup>3</sup> , n=12		Collected EMPSGC <sup>®</sup> Cases*, n=63		Previously Published EMPSGC <sup>®</sup> Cases, n=86 <sup>¶</sup>	
Lower	66.7%	Lower	55.6%	Lower	48.8%
Upper	16.7%	Upper	36.5% <sup>++</sup>	Upper	25.6%
Cheek	16.7%	Canthus	3.2%	Cheek	9.3%
		Temple	1.6%	Canthus	7.0%
		Both Lower and Upper	1.6%	Scalp	3.5%
				Auricular (retro/supra)	2.3%
				Temple	1.2%
				Occipital	1.2%
				Eyelid, NOS	1.2%
Total	100%		100%		100%
<sup>®</sup> EMPSGC <sup>®</sup> includes lesions with in situ carcinoma, pushing invasion, and invasive mucinous components					
Upper = upper eyelid, Lower = lower eyelid					
<sup>*</sup> Does not include 10 previously published cases included in our original data collection (Hoguet et al. and Turnbull et al.), <sup>13,19</sup> but does include 12 cases published from original series by Zembowicz et al. <sup>4</sup>					
<sup>¶</sup> One case did not have specific data regarding upper or lower eyelid, counted with lower eyelid					
<sup>++</sup> One case included the upper eyelid and medial canthus and was counted as ‘upper eyelid’					

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