

Facial Keratoacanthoma: Treatment Option Cost Analysis & Outcomes

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Objectives

1. Describe the clinical presentation and address the controversial nosology of keratoacanthomas (KA's).
2. Perform a cost analysis of the most common treatment options for KA's.
3. Briefly review surgical and medical treatment modalities used to treat KA's and their therapeutic outcomes.

Background

Keratoacanthomas (KAs) are nodular cutaneous neoplasms commonly found on sun exposed surfaces of the head and neck in the elderly. Many authors argue that KAs are a clinical variant of cutaneous squamous cell carcinoma (CSCC) based on similarities in histopathology, risk factors, and metastatic potential. However, KA's unique potential for spontaneous regression fuels the historical opinion that these tumors are benign neoplasms distinct from CSCC (See adjacent table). These two divergent theories pose a unique therapeutic challenge. A variety of medical and surgical therapies exist for the treatment of KAs. A review of literature supports complete surgical excision as a reliable treatment option that provides a histological diagnosis with excellent cosmetic outcomes and is the standard of care for the treatment of solitary KAs. However, situations in which surgery is not desired or contraindicated, intralesional methotrexate and fluorouracil have been documented to offer a good therapeutic results with cosmetically acceptable outcomes.^{2,4} Due to its high prevalence in the head and neck, otolaryngologists should be aware of the controversial nosology, clinical presentation, and available therapeutic options for the treatment of solitary and multiple KAs. Additionally, it is useful to know not only what the clinical outcomes for various treatments are but what the cost for a treatment modality may be. While not often employed by otolaryngologists intralesional therapies can be very simple, effective, and cost-effective means of cure. The aim of this study is to determine the actual cost for some of these treatments and weight some of the risks and benefits of each.

Clinical stages of KA

Proliferation (2-4 weeks): rapidly enlarging smooth, firm, symmetrical erythematous papule often reaching a size of 2cm or more

Maturation: bud-, dome-, or berry-shaped erythematous nodule with an umbilicated central keratin core

Regression (4-6 months, can take up to 1 year): necrotic nodule; expulsion of the central keratin core gives the nodule a crater-form appearance; subsequently the lesion progressive flattens, leaving a slightly depressed hypopigmented scar

Results

Review of the literature shows that wide local excision and Mohs micrographic surgery have comparable disease control rates with 4-8% and 2.4%, respectively.¹ Intralesional therapies have also proved to be effective with greater than 90% cure rate (Table 1)⁴. While intralesional therapies are efficacious, it must be noted in the literature that a diagnosis is often made clinically and there is no biopsy to confirm the diagnosis of a KA or rule out the presence of CSCC. Furthermore, surgical excision, particularly Mohs micrographic surgery is indicated in cosmetically sensitive areas such as the eye, nose, or lip. In this case, we did have a biopsy that showed a CSCC necessitating wide local excision. However, if the biopsy were benign and the lesion in a less precarious location it might have been treated with less cost and comparable outcome.

When examining the cost difference for the various treatment options for treating KA's there is an impressive disparity from one modality to another (Tables 2&3). The itemized cost for the procedures are listed below in Table 3. The allocation of agents such as methotrexate and 5-FU is quite inexpensive (Table 2).



Figure 1. One centimeter firm, dome-shaped erythematous nodule with an umbilicated necrotic, keratin filled core

Figure 2. Acceptable early outcome (10 days post takedown) with moderate alar notching on the right

Table 1^{2,4}

	Intralesional 5-FU	Intralesional Methotrexate
Success rate	98.5% (66/67)	92% (35/38)
Recurrence rate	0% (0 – 24 months)	0% (0 – 86 months)
Amount per injection	25-75 mg	17.8 mg
Concentration	50 mg/mL	12.5 or 25 mg/mL
Dosing interval	Weekly	2-3 weeks
Mean number of injection	3	2.1
Cost per injection	\$1.551 per 500 mg	\$2.00 per 50mg

Therapeutic options for solitary KA

Surgical treatments	Physical destruction	Medical treatments
Surgical excision	ED&C	Radiotherapy
Mohs Micrographic Surgery	Cyrosurgery	Intralesional and topical 5-FU
	Liquid nitrogen	Intralesional methotrexate
	Laser vaporization	Intralesional bleomycin
	Argon	Intralesional interferon alpha-2a
	CO2	Intralesional corticosteroid
	YAG	

Table 2

		Procedure cost	Medicare price for units listed	Price per injection	Total price after average number of treatments
Methotrexate sodium inj	50 MG	\$65.64	\$2.30	\$66.46	\$139.57
Fluorouracil inj	500 MG	\$65.64	\$1.55	\$65.80	\$197.39
Bleomycin sulfate inj	15 UNITS	\$65.64	\$31.83	\$66.49	\$199.47



Patient treated with intralesional methotrexate before therapy (D), after first injection (E), and at 2 month follow (F). Photo from *Intralesional methotrexate treatment for keratoacanthoma tumors*. Annet et. al. *Jour of the American Acad of Derm.* June 2007;56:989-9.

Table 3

Procedure	CPT code	Payment Rate	National Unadjusted Copayment	Minimum Unadjusted Copayment	TOTAL
Excision nose with rearrangement	14060	\$1,055.29		\$211.06	\$1,266.35
Excision lesion benign 2.1-3cm	11443	\$545.42		\$109.09	\$654.51
Excision lesion malignant 2.1-3cm	11643	\$545.42		\$109.09	\$654.51
Complex repair	13132	\$227.34		\$45.47	\$272.81
Full thickness graft	15240	\$1,055.29		\$211.06	\$1,266.35
Split thickness graft	15120	\$1,391.57		\$278.32	\$1,669.89
Mohs	17311	\$297.58	\$91.69	\$59.52	\$357.10
Mohs- each additional step	17312	\$297.58	\$91.69	\$59.52	\$357.10
Intralesional injection	11900	\$54.70		\$10.94	\$65.64

Conclusions

Complete surgical excision offers a reliable treatment option with the advantages of both histological diagnosis and surgical margins and is therefore the standard of care for the treatment of solitary KAs of the head and neck. However, situations in which surgery is not desired or contraindicated, intralesional methotrexate or 5-fluorouracil have been shown to offer an effective treatment with a cosmetically acceptable outcome at a lower cost. This is evidenced by the review of the literature and cost analysis performed in this poster. While surgery still offers the best chance for cure without recurrence the effectiveness of intralesional therapy is apparent and surgery can always be reserved for salvage. Finally, all cases of suspected KA should be verified by incisional biopsy.

References

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