Abstract

Background: There are several treatment options for keratoacanthoma (KA). However, there are limited data available on the use of cryosurgery. Objective: To evaluate the effectiveness and safety of a combination treatment for KA and to evaluate the cosmetic outcome.

Materials and Methods: The combination treatment incorporates the use of curettage, electrodessication, and cryotherapy. A retrospective study was conducted on 90 patients with KA who had been treated with this method between 2000 and 2014. The follow-up period lasted 2 years and photographs were available for every visit of the patients to the department. Results: The success rate was found to be 97.8%. No serious adverse events were observed. No infections were reported. The cosmetic outcome was evaluated as excellent for all patients. Discussion: The combination method appears to combine the advantages of both destructive treatment and surgical excision. It appears to be a safe and effective treatment method. However, there are certain limitations to this study. Conclusions: More studies are needed to evaluate the effectiveness and safety of this method.

Key Words: Cryotherapy, curettage, electrodessication, keratoacanthoma

Introduction

Keratoacanthoma (KA) is a distinctive tumor with characteristic histopathological and clinical features. It is a benign, relatively common (104 cases per 100,000 individuals), and rapidly growing tumor. If left to run its natural course, it regresses spontaneously, leaving behind an unsightly scar. There are a lot of therapeutic modalities for KA, including surgical excision, radiotherapy, Mohs’ chemosurgical technique, curettage and electrodessication, cryosurgery, argon laser therapy, corticosteroids, podophyllin, systemic retinoids, 5-fluorouracil, bleomycin, methotrexate, cyclophosphamide, interferon-α, and photodynamic therapy. However, there are limited data on the use of cryosurgery in the treatment of KA.

Objective

In our hospital’s department of cryosurgery, a combination method is being used in the treatment of KA. The method involves curettage of the lesion, electrodessication, and two freeze–thaw cycles [Figure 1a and b]. Our aim was to evaluate the effectiveness and safety profile of this method as well as its cosmetic outcome.

Materials and Methods

The method used in our department begins with a punch biopsy of the tumor. Although this step does not remove the entire tumor, it provides a minimal tissue sample and an estimation of the depth of the tumor. Then, the tumor is completely removed with the aid of a curette. The treating physician tries to remove the tumor as a whole in an effort to provide the best possible tissue for histologic examination. Then, the base of the tumor is treated with electrodessication. This stage provides hemostasis and destroys possible remaining tumor tissue. Finally, the area is treated with cryotherapy. Two freeze–thaw cycles are employed, using the open spray technique. Each cycle lasts approximately 20 s. This stage aims at the complete destruction of any residual tumor cells at the treated area. The freeze halo spreads beyond the clinically visible margin of the tumor, in an effort to destroy tumor cells located beyond the visible margin. Then, the area is...
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covered with gauze. For the following 15 days, antiseptic lotion and gel are applied at the treated area and daily wound dressings are applied.

The department keeps a record of the patients who have been treated with this method and follows them up for at least 2 years. The treated areas are being photographed pre- and postoperatively, as well as in every visit during the next 2 years [Figures 2a, b and 3a, b].

A formal approval by the hospital’s Ethics Committee was obtained to collect data from the files of patients with KA who have been treated in our hospital’s department of cryosurgery. Through the department’s registry, we collected data for patients who had been treated with this method from 2000 to 2014. We calculated the method’s success rate, the number of relapses, and the number of serious adverse events. Photographs were available for all patients preoperatively, postoperatively, and for every visit in the department for the 2-year follow-up period. The photographs were evaluated with the purpose of estimating the final cosmetic outcome. The evaluation was performed by the investigators using all available photographs of the patients.

Results

From 2000 to 2014, ninety patients were found to have been treated with this method. Eighty-eight were considered to have been fully cured, as there were no relapses in a 2-year follow-up period. Only in two cases, a new lesion appeared at the treated area few weeks after treatment. A biopsy was performed, and in both cases, the histological diagnosis was pseudoepitheliomatous hyperplasia. The first patient with this finding had the lesion completely removed surgically to confirm diagnosis. The patient was followed up for 2 years and showed no signs of relapse. Keeping in mind the course of events in the case of the first patient, a different diagnostic procedure was selected when the second patient with a possible relapse appeared. Instead of a complete surgical excision of the lesion, a punch biopsy was performed. The histological report confirmed the diagnosis of pseudoepitheliomatous hyperplasia. The lesion was left to run its natural course with close clinical monitoring (weekly visits to the department). The lesion disappeared spontaneously few weeks later.

The success rate of the method was found to be 97.8%. The two patients with pseudoepitheliomatous hyperplasia were not considered to have been successfully cured. However, the histologic report excluded the possibility of relapse in these two cases. As for the healing time needed, when the combination treatment is employed, whole of the treated areas had fully healed within 4–6 weeks in all cases. No serious adverse events were observed. As to the final cosmetic outcome, it was evaluated as excellent, given that scarring was minimal. The evaluation was performed by the investigators using all available photographs of the patients. Photographs were available for all ninety patients preoperatively, postoperatively, and for every visit in the department for the 2-year follow-up period.

Discussion

KA is a benign tumor, yet there is a need to clearly distinguish it from invasive squamous cell carcinoma. This means that a biopsy is necessary. If conventional surgical removal of the entire tumor is carried out, there
is a possibility of significant scarring. On the other hand, a destructive method eliminates the ability to confirm the diagnosis histologically. A destructive method would be preferred if the cosmetic outcome was the main goal, because it would result in less scarring. The combination treatment discussed seems to combine the advantages of both methods. It provides adequate tissue for histologic diagnosis, while resulting in minimal scarring. Moreover, it appears to have an excellent cure rate, which was found to be 97.8% in this study.

However, there are several limitations concerning this study. The group of patients consisted almost entirely of Caucasian people. This could be limiting our results to certain ethnic groups. Moreover, to histologically distinguish KA from squamous cell carcinoma, an adequate tissue sample has to be provided to the pathology laboratory. This means that during tumor curettage, the physician has to be careful to remove the tumor as a solid piece of tissue (en bloc) and not to crush the tumor with repeated scraping movements. If the treating physician is not careful enough, the tissue sample could prove to be inappropriate for histological examination. However, even if this occurs, there is always the tissue sample of the punch biopsy. It serves as a minimal tissue sample and can provide an estimation of the depth of the tumor. As a result, the method’s potential for histological diagnosis depends partially on the skills of the treating physician. Another limitation is the fact that the cosmetic outcome was evaluated only by the investigators as there were no records of the patients’ personal opinion.

**Conclusions**

- The success rate of the method was 97.8%
- There were no serious adverse events
- The cosmetic outcome was evaluated as excellent by physicians
- The method provides adequate tissue for histopathological diagnosis
- The combination treatment could be considered as an effective and safe option for patients with KA
- There are certain limitations to this study
- More studies are needed to compare the effectiveness and safety of the method to other treatment modalities for KA.

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**Conflicts of interest**

There are no conflicts of interest.

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