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Radiotherapy

Keratoacanthoma Centrifugum Marginatum: A Reported Case

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Abstract | **Case Report**

Keratoacanthoma is a rapidly growing skin tumor that often regresses spontaneously, but is frequently misdiagnosed as cutaneous squamous cell carcinoma, leading to underreporting and diagnostic challenges. It commonly affects men with sun-damaged skin, though rare variants like keratoacanthoma centrifugum marginatum may reach large sizes and resist spontaneous resolution. Diagnosis hinges on clinical presentation, triphasic growth pattern, and histopathological analysis. Treatment is typically advised due to potential for local destruction and diagnostic uncertainty. Standard excision is preferred for solitary lesions, while Mohs surgery, radiation therapy, and intralesional or topical chemotherapies are options for complex cases. Despite many therapeutic approaches, there are no universally accepted treatment guidelines, and recurrence rates vary from 1% to 8%.

Keywords: Keratoacanthoma (KA), Squamous cell carcinoma (SCC), Mohs surgery, Radiotherapy, Chemotherapy.

INTRODUCTION

Keratoacanthoma is a common cutaneous tumor characterized by rapid growth and possible spontaneous regression. It most commonly affects older, fair-skinned males with significantly sun damaged skin [1]. It remains controversial regarding classification, epidemiology, diagnosis, prognosis, and management. Historically, keratoacanthoma have been considered a variant of cutaneous squamous cell carcinoma [2]. The lesions are typically widespread. Radiation, immunosuppression, skin trauma have been reported as potential risk factors. Human papillomavirus (HPV) has also been detected in sporadic KA [3].

Two striking features of keratoacanthoma are its clinical behavior with spontaneous regression after rapid growth and its nosological position on the border between benignity and malignancy [4]. The keratoacanthoma may present clinically as a solitary lesion or multiple lesions, in a sporadic fashion or in an inherited syndrome, or in association with inflammatory diseases. Keratoacanthoma centrifugum marginatum shows persistent peripheral growth with central scarring and may become very extensive [5]. Standard treatment is the excision of the lesion, Mohs surgery, and in case it is not possible, treatment with radiation therapy, chemotherapy, or corticosteroids is possible.

We report the case of a 44-year-old man, affected by keratoacanthoma centrifugum marginatum, treated with Radiotherapy VMAT. We believe this is the first described case of keratoacanthoma in the lumbar area, a non-exposed sun region.

CASE REPORT

- **Clinical Examination**
- A 44-year-old patient with a history of lumbar trauma due to an accident in 2015 developed an ulcerative lesion in the lumbar region, for which no medical consultation was initially done. The patient later underwent surgery for a lumbar fracture, during which the lesion was excised (undocumented). Histopathological analysis revealed a keratoacanthoma, but the patient was subsequently lost to follow-up. In early 2020, the lesion recurred at the same lumbar site. The patient presented again for consultation in June 2024.

- **TAP CT**: Subcutaneous soft-tissue tumoral process of the right sacral and gluteal regions locally infiltrative, measuring 22 cm, locally infiltrative, and associated with right iliac and bilateral inguinal lymphadenopathy. No secondary pulmonary, abdomino-pelvic or bone lesions.

- Clinically, the examination found a budding, malodorous lesion with findings of pus, taking up the entire lumbar region, and the upper buttocks, with purplish outlines. Neurological examination showed no abnormality.

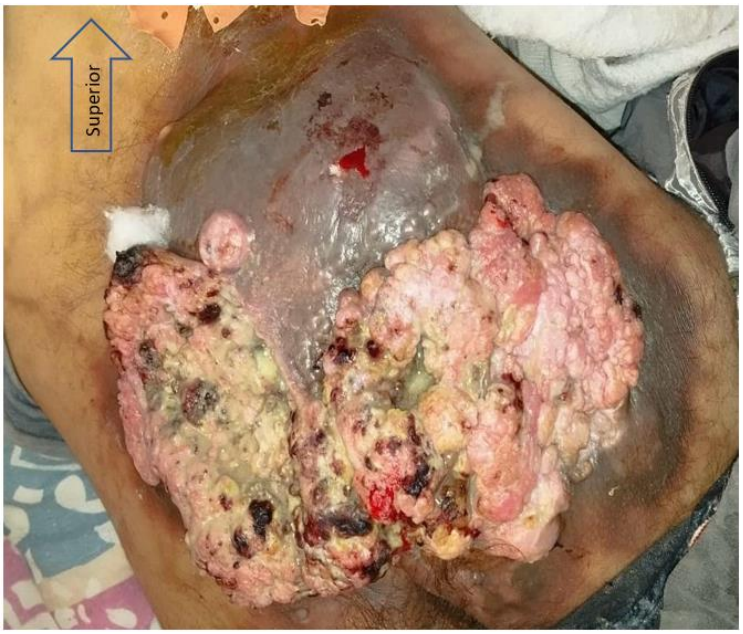

Figure 1: lesion of the lumbar region, upper buttocks, with purplish outlines (Intergluteal fold below)

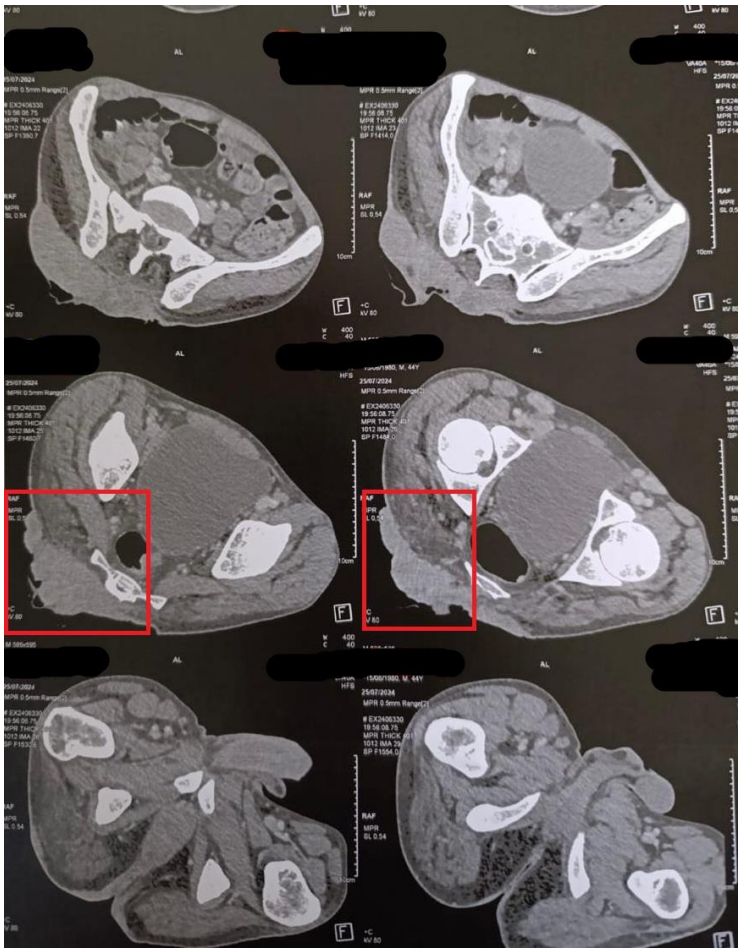

Figure 2: Subcutaneous soft-tissue tumoral process of the right sacral and gluteal regions

Multidisciplinary meeting decided for a surgical resection, but the lesion was judged non-resectable due to the extent of the lesion, complexity of the surgery, and presence of local infection. The decision was to initiate radiotherapy as primary treatment. Antibacterial therapy was started to manage the infection. he patient received a total dose of 60 Gy in the prone position, with a 1 cm volumetric boost for cutaneous involvement, delivered using VMAT. The course of treatment was complicated by grade 3 radiodermatitis, which was treated by symptomatic treatment. An impressive amelioration was seen. The patient is currently under clinical surveillance.

DISCUSSION

The true incidence of keratoacanthoma is probably underestimated because of misdiagnosis as a squamous cell carcinoma, or spontaneous regression before the diagnosis can be made [4]. Keratoacnathomas are keratin-plugged, cutaneous, crater-shaped nodules that arise spontaneously, grow fast, and then typically regress. The lesion has been described as far back as 1889 and under different names such as molluscum sebaceum. Patients with Fitzpatrick skin types I-II and a history of sun damage and trauma are usually afflicted [6]. It is generally located in patients in their 40s to 60s [5]. Men are more often affected than women [4].

Reports estimate the incidence of keratoacanthoma to range between 100 and 150 cases per 100,000 individuals; however, this is likely underestimated due to misclassification of these lesions as well-differentiated cSCC, underreporting, or spontaneous regression before diagnosis [2]. In contrast to ordinary SCC, KA is assumed to originate from the hair follicle [4]. As a matter of interest, the most relevant criteria in favor of KA are architectural, whereas the most relevant criteria for the diagnosis of SCC are cytological [7].

Several types of keratoacanthoma exists. In our case it was a keratoacanthoma centrifugum marginatum which is a unique form of keratoacanthoma that is characterized by a peripheral expanding tumor with central healing that may be over 20 cm in diameter [1]. There may be no spontaneous resolution, or it may heal in 6 to 12 months rather than the 2 to 6 months for the common keratoacanthoma. It involves the face, trunk, or extremities. Only about 25 cases have been reported. It was first described by Miedzinski and Kozakiewiczi who coined the term keratoacanthoma centrifugum [8].

Diagnosis of KA is based upon three key facets: characteristic clinical presentation of a rapidly developing crateriform lesion over the course of weeks to months, triphasic evolution consisting of proliferation, stabilization, and regression, histopathology of an adequate specimen with intact architecture [2]. Within dermatology and dermatopathology, no consensus has been reached as to whether keratoacanthomas are benign or malignant neoplasms [6]. It is standard practice to treat keratoacanthomas rather than monitor them for spontaneous resolution [5].

There are numerous treatment modalities available for the management of keratoacanthoma, however current treatment guidelines are lacking and there is no consensus on the most appropriate therapy for each subtype [1].

Standard excision is the treatment of choice for a majority of solitary keratoacanthoma. This treatment modality is advantageous for rapid treatment, prevention of local invasion and tissue destruction. Recurrence after standard excision may range from 4 to 8 percent. Mohs, micrographic surgery, is particularly useful for aggressive lesions, such as giant keratoacanthoma and keratoacanthoma centrifugum, or locally destructive keratoacanthomas [1]. Unfortunately, there are no specific margins established for keratoacanthoma, but the same as for noninvasive SCC can be advised (5 mm) to assure 95% chance of complete removal [4]. However, surgical intervention may lead to substantial defects with significant functional or cosmetic morbidity, depending on size and location. In addition, patients with comorbid conditions may be poor surgical candidates [9].

Radiotherapy is rarely used for the treatment of keratoacanthomas, though it is known that these lesions are extremely sensitive to this treatment modality [1]. It has been a proposed option for cosmetically sensitive, non operable regions. Radiation therapy may induce eruptive keratoacanthoma. All tumors resolved with satisfactory cosmetic results and without recurrence within a five-year observation period [1]. There are no current established guidelines for radiotherapy for keratoacanthoma. Most authors recommend full cancericidal doses of 40 to 60 Gy for giant keratoacanthomas [10].

In 52 cases, the total dose delivered was 40 Gy; this dose was administered in two weekly fractions of 4 Gy. Farina *et al.,* reported five cases of large aggressive and destructive keratoacanthomas of the facial area that were treated with high total doses (45 to 50 Gy) given in 10 to 20 fractions of orthovoltage with a HVL of 3 mm of aluminum [11].

Because of their large size and depth, aggressive keratoacanthomas require relatively penetrating radiation qualities. In most patients, a HVL of 1 to 2 mm of aluminum will be satisfactory. This HVL can be achieved with superficial x-ray units, orthovoltage machines, or electron beam equipment [11]. In our case, VMAT Radiotherapy was used. A dose of 60 Gy was delivered Gy in ventral decubitus position, with a 1 cm boost to account for cutaneous involvement.

Methotrexate and 5-fluorouracil are preferred as intralesional drugs, with Bleomycin or interferons being another option. Intralesional chemotherapy can precede surgery to reduce the size of tumor of about 50% to 80% before the excision [4].

Topical 5-FU remains one of the first-line agents for treatment of keratoacanthomas. Oral methotrexate is another potential therapeutic option to treat keratoacanthoma [1]. Cyclophosphamide was shown to be effective in retinoid and methotrexate-resistant cases of multiple keratoacanthomas. Intralesional corticosteroids are occasionally used with good response either as monotherapy or with systemic retinoids. The recurrence rate ranges from 1% to 8 [4].

In nearly 1000 published cases of Keratoacanthomas, only some 20% of lesions have been observed through to spontaneous regression [12]. Because most keratoacanthoma do have a good prognosis with conservative treatment [5], further investigation is needed to reliably discriminate keratoacanthoma from squamous cell carcinoma to better inform patient prognosis, guide clinical management, and optimize outcomes [2]

CONCLUSION

To our knowledge, this is the first documented case of keratoacanthoma centrifugum marginatum in the lumbar region, with an important lesion. The major challenge in management of these tumors is the difficulty in histologic and clinical differential diagnosis with regard to squamous cell carcinoma. Macroscopic and histological examinations are very important for establishment of the proper diagnosis and management, especially for larger tumors similar to the case presented [13]. Many features of kertoacanthoma are unexplained, including its rapid appearance and evolution, its tendency to regress spontaneously, and its relatively frequent recurrence. Fortunately, this common tumor usually runs a benign course and responds well to office therapy [14].

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