

Carcinoma Arising In The Leg Amputation Stump

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Citation

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Abstract

Amputation of lower extremity followed by use of leg prosthesis is very common. However, malignancy arising in the amputation stump is extremely rare. We are reporting such a case occurring in a 58-year-old man. Review of the English literature reveals only five additional cases occurring in men with an average age of 65 years and after a mean lag period of 40 years between the amputation and development of a low-grade squamous cell carcinoma.

INTRODUCTION

Amputation of the leg followed by the use of artificial leg is very common. However, a malignant tumor arising in an amputation stump remains a very rare occurrence.

The purpose of this paper is to report a case of verrucous carcinoma arising in an amputation stump with a review of all other cases of malignancy arising in stumps published in the English literature.

CASE REPORT

A 58-year-old man sustained a left knee dislocation with neurovascular injury in 1968.

He underwent a left below the knee amputation and was fitted with an artificial leg. The stump was quite short, about 2-3 inches below the knee joint. He had continued difficulty with proper fitting of the prosthesis over the years. Almost 36 years later in 2004, the patient started experiencing increased pain at the amputation site and noted foul discharge from the area. The skin over the distal stump was macerated, ulcerated with purulent foul smelling exudate. He was managed in the wound care clinic with wound cleaning and antibiotics over the next year and half. During that period, the distal stump area developed enlarging hypertrophic appearing fungating tissue. He was unable to use the leg prosthesis.

The patient underwent a left above the knee amputation with an uneventful postoperative course.

The amputated stump showed a 5.0X5.0 cm raised, exophytic, and fungating mass with central ulceration over the distal aspect of the stump (Fig. 1). Microscopically, the

lesion was a verrucous type of squamous cell carcinoma showing papillomatous epidermal growth with hyperkeratosis and pushing type of dermal invasion with bulbous proliferation of well-differentiated keratinocytes (Fig. 2).

Figure 1

Figure 1: Amputated stump shows a raised fungating mass.



Figure 2

Figure 2: Low magnification shows papillomatous epidermal tumor with hyperkeratosis and pushing type of dermal invasion by well-differentiated keratinocytes.

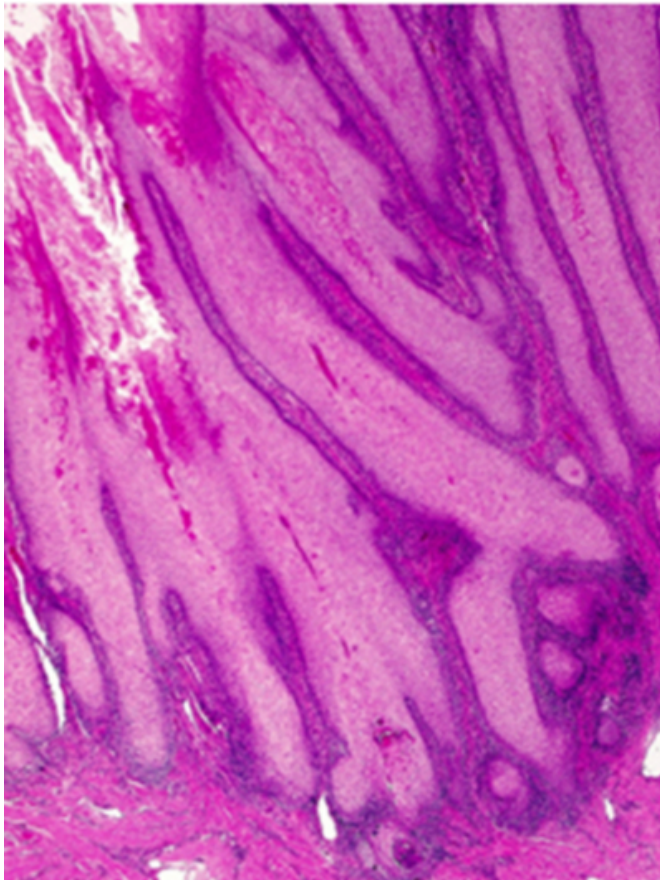
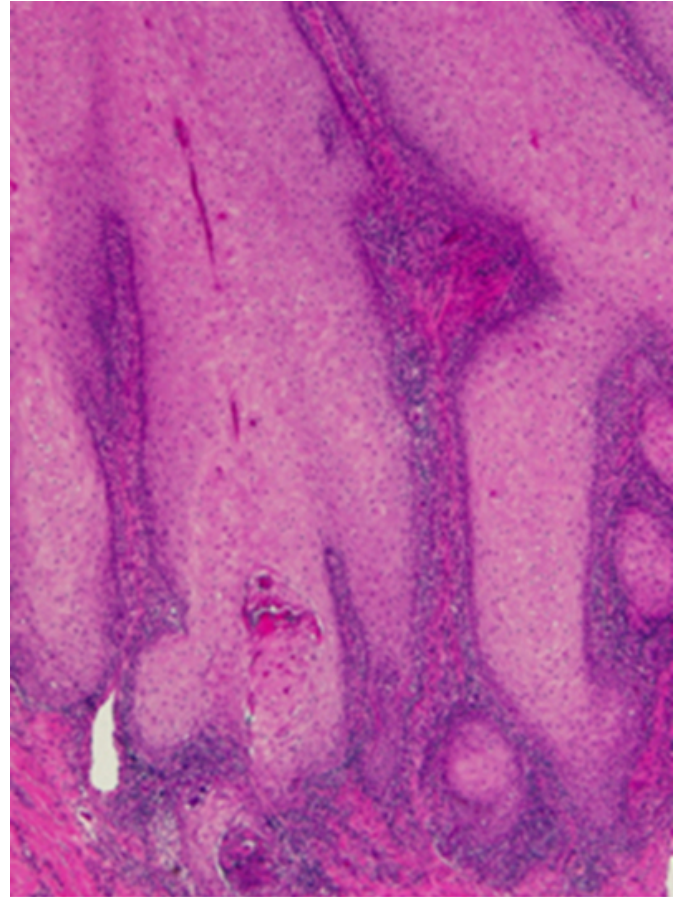


Figure 3

Figure 3: Verrucous carcinoma at a higher magnification.



DISCUSSION

About 60,000 leg amputations are performed each year in the United States [1]. These patients are usually fitted with leg prosthesis. The distal aspect of the stump has the scar from surgical closure. Whereas malignant tumor, commonly a squamous cell carcinoma is known to occur in scarred tissue from burn, chronic ulcers, wounds, sinus and fistulous tracts [2,3], the occurrence of cancer in amputated leg stump is very rare.

The earliest report of a stump carcinoma that we could find in the English literature was in 1965 describing a 75-year-old white man who had undergone a left above the knee amputation following a railroad accident [4]. He was fitted with leg prosthesis. Forty-seven years later, the patient developed a well-differentiated squamous cell carcinoma at the amputation stump scar. He underwent a high thigh amputation and inguinal lymph node dissection. There were no metastases.

In 1985, one of us (DS) reported a case of a 60-year-old man who developed a low-grade squamous cell carcinoma on the

below-the-knee amputation stump [5]. The patient had undergone amputation of his leg 30 years earlier because of traumatic injury and burn suffered in a dynamite explosion. He used an artificial leg since then. The patient developed the cancer in the burn scar rather than in the scar of stump closure. He was treated with above-knee amputation. There was no evidence of metastatic spread.

In 1991, there were two reports of carcinoma arising in leg amputation stump [6,7]. In one report [6], a 56-year-old man developed a rapidly growing squamous cell carcinoma at the end of his right below-knee amputation stump 27 years after his leg was amputated for gangrene from a snake-bite injury. He was using a poorly constructed prosthesis. The tumor was widely excised. The carcinoma arose in the scar tissue of the stump. There was no distant spread. The other case [7] was that of a 65-year-old man who developed a verrucous squamous cell carcinoma at the stump about 45 years after he underwent a traumatic below-the-knee amputation followed by use of leg prosthesis.

The tumor was locally excised with a revision of the amputation.

The latest report of a carcinoma arising in an amputation stump was that of a 62-year-old man who developed a well-differentiated squamous cell carcinoma on his right thigh amputation stump 52 years after the procedure [8]. The amputation was performed because of a land mine injury. He was using a leg prosthesis ever since. The patient underwent a surgical revision of the amputation stump and inguinal lymph node dissection. There was no metastatic spread.

Malignancy occurring in leg amputation stump remains a rare event as evidenced by only six such reported cases (including the present case) in the English literature since 1965.

All the patients were male, aged 56 to 75 years with a mean age of 63 years. Amputation was done mostly for trauma [4,5,7,8]. In two cases [5,6], burn from dynamite and mine explosion was an additional factor. The time between the amputation and the development of malignancy at the stump

ranged from 27 to 52 years with a mean lag period of 40 years. All patients developed low-grade squamous cell carcinoma, of which two patients showed a verrucous type of squamous cell carcinoma.

The factors that may lead to malignancy at a stump may include long-standing scar tissue and burn injury. Whether chronic irritation and rubbing by the prosthesis over the scar tissue may lead to malignant change is unknown. The vast majority of the lower extremity amputations in the United States are done for atherosclerotic peripheral vascular disease, especially among the diabetics. These patients with amputated legs are older and may not live long enough to develop stump carcinoma because the average lag period of developing such a lesion is 40 years. The patients who have undergone amputation at a younger age may have a small risk of developing malignancy at the stump over their lifetime.

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