



# Subungual Squamous Cell Carcinoma of the Thumb Treated by “Function Sparing Approach” Using Contact Radiotherapy (Brachytherapy)

Luca TAGLIAFERRI,<sup>1</sup> Valentina LANCELLOTTA,<sup>1</sup> Bruno FIONDA,<sup>1</sup> Giulia PANZA,<sup>2</sup>  
Patrizia CORNACCHIONE,<sup>1</sup> Giuseppe COLLOCA,<sup>1</sup> Luigi AZARIO,<sup>3</sup> Gian Carlo MATTIUCCI,<sup>2</sup>  
Maria Antonietta GAMBACORTA,<sup>2</sup> Vincenzo VALENTINI<sup>2</sup>

<sup>1</sup>U.O.C. Radioterapia Oncologica, Dipartimento di Diagnostica per immagini, Radioterapia Oncologica ed Ematologia, Fondazione Policlinico Universitario “A. Gemelli” IRCCS, Rome-Italy

<sup>2</sup>U.O.C. Radioterapia Oncologica, Dipartimento di Diagnostica per immagini, Radioterapia Oncologica ed Ematologia, Istituto di Radiologia, Fondazione Policlinico Universitario “A. Gemelli” IRCCS, Università Cattolica del Sacro Cuore, Rome-Italy

<sup>3</sup>U.O.C. Fisica Sanitaria, Dipartimento di Diagnostica per immagini, Radioterapia Oncologica ed Ematologia, Istituto di Fisica, Fondazione Policlinico Universitario “A. Gemelli” IRCCS, Università cattolica del Sacro Cuore, Rome-Italy

## SUMMARY

A-48-year old man, affected by HIV, working as an electrician, presented a swollen and painful subungual lesion over the distal phalanx of the right thumb with an important limitation to his job. A cutaneous examination of the right thumb revealed an irregular erosive crusted mass formation about 2 cm×1 cm size with erythematous changes and complete destruction of the overlying nail plate. There was no evidence of regional lymphadenopathy; the patient was studied with computed tomography that did not show any distant disease. A conservative onychectomy was performed with removal of the lesion and with histological confirmation of SCC. However, after five months, the patient presented local recurrence over the thumb. Amputation was proposed, but the patient declined due to the negative impacts on his job. Thus, contact radiotherapy (i.e., brachytherapy, BT) was proposed. BT was delivered using a customized home-made surface mold with six plastic tubes arranged around. The total delivered dose was 40 Gy delivered in eight fractions, 5 Gy for daily using Iridium-192 High Dose Rate (HDR) source. Four years later, recently, the patient is free from disease and has a complete functionality of the thumb without any limitations in any movement and in his job. The patient only reported a slight sensitivity reduction.

**Keywords:** Brachytherapy; contact radiotherapy; interventional radiotherapy; thumb carcinoma.

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## Introduction

In squamous cell carcinoma (SCC) the first-choice treatment is surgery.[1,2] However, radiotherapy is often used as an alternative or in combination with surgery with an organ and function preserving intent, such as in head and neck cancer, anal cancer and cervical cancer.[3,4,5] In this case report we aim to highlight

the chance to use this therapy also for function sparing approach in skin cancer.

## Case Report

A-48-year old man, affected by HIV, working as an electrician, presented a swollen and painful subungual lesion over the distal phalanx of the right thumb with an important limitation to his job.

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Dr. Bruno FIONDA

U.O.C. Radioterapia Oncologica,  
Dipartimento di Diagnostica per immagini,  
Radioterapia Oncologica ed Ematologia,  
Fondazione Policlinico Universitario “A. Gemelli” IRCCS,  
Rome-Italy  
E-mail: bruno.fionda@yahoo.it

A cutaneous examination of the right thumb revealed an irregular erosive crusted mass formation about 2 cm×1 cm size with erythematous changes and complete destruction of the overlying nail plate (Fig. 1a). There was no evidence of regional lymphadenopathy; the patient was studied with thorax and abdomen CT that did not show any distant disease.

A conservative onychectomy was performed with removal of the lesion and with histological confirmation of SCC. However, after five months, the patient presented local recurrence over the thumb. Amputation was proposed, but the patient declined due to the potential negative effects on his job. Thus, contact radiotherapy (brachytherapy, BT) was proposed. BT was delivered using a customized home-made surface mold (Fig. 2a) with six plastic tubes arranged around. The total delivered dose was 40 Gy delivered in eight fractions, 5 Gy for daily using Iridium-192 High Dose Rate (HDR) source. In figure 2b, the dose distribution is presented. Four years later, recently, the patient is free from disease and has a complete functionality of the thumb without limitation in any movement and in his job (Fig. 1b). The patient only reported a slight sensitivity reduction.

## Discussion

Subungual SCC is a rare malignancy. The diagnosis of subungual SCC is often delayed or missed because of the nonspecific clinical presentation. In fact, for its variable clinical presentation, it can be often misdiagnosed with the benignant condition, such as a chronic paronychia, onychomycosis, pyogenic granuloma, sub-

ungual wart, glomus tumor, ingrown nail, subungual exostosis, chronic osteomyelitis, traumatic dyschromia, keratoacanthoma, and melanotic nevus.

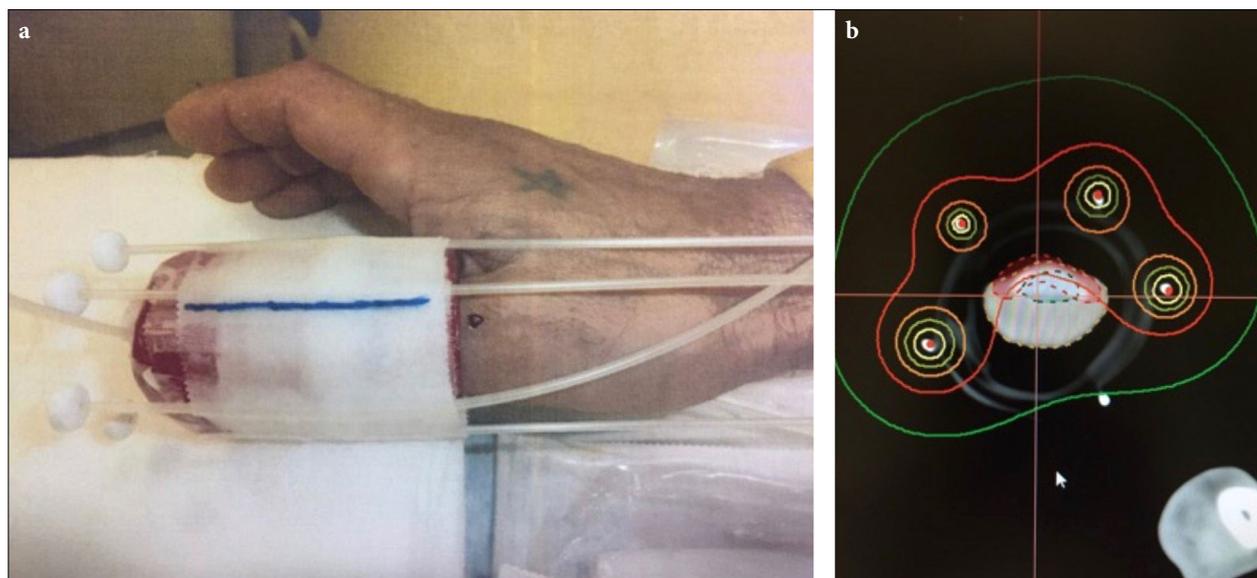
Several factors reportedly predispose individuals to subungual SCC, including HPV, chronic trauma, chronic inflammation, chronic infection, ionizing radiation, solar radiation, tar, arsenic or other mineral exposure and immunosuppression.[6] Usually, definitive surgery consists of the amputation of the phalanx, causing aesthetic damage and functional limitation.[7] In fact, this finger has a primary role in grabbing and carrying out normal daily activities,[8,9] especially in the case of local recurrences, radiation therapy represents a valid alternative to re-excision or amputation both with potentially functional impairment.[10,11] Contact radiotherapy is a radiation treatment where the radioactive source is placed temporarily in contact the tumor site[12,13] and allows to target the dose on the target volume, while sparing the surrounding normal tissues because of a rapid fall-off representing a valid therapeutic option, it has been widely demonstrated in other peculiar anatomical districts.[14,15] This allows us to minimize the side effects of radiotherapy and allows such an approach to be also considered for frail and elderly patients.[16,17]

## Conclusion

The best therapeutic choice for thumb skin cancer is challenging, considering the absence of the standardized guidelines. Contact radiotherapy (brachytherapy) could be considered a valid alternative to surgery, with organ and function sparing results.



**Fig. 1.** (a) Thumb at diagnosis, (b) thumb after 4 years.



**Fig. 2.** (a) Customized home-made surface mold, (b) Dose distribution.

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**Conflict of Interest:** None declared.

**Authorship contributions:** Concept – L.T.; Design – V.L.; Supervision – L.A., G.C.; Data collection &/or processing – P.C.; Analysis and/or interpretation – None; Literature search – G.P.; Writing – B.F., G.C.M.; Critical review – M.A.G., V.V.

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