

Basosquamous Carcinoma of the Hand in a Radiologist with Prolonged Radiation Exposure

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Basosquamous carcinoma is a rare epithelial neoplasm, mostly occurring on the head and neck area. There are few reports of basosquamous carcinoma on the finger. Here, the authors experienced treatment of basosquamous carcinoma on the finger in a radiologist. Treatment was successful by the wide excision and the cross-finger flap operation with a split-thickness skin graft and K-wire fixation. The rare finger basosquamous carcinoma case in our study is likely to be linked with radiation. Considering of the high reliance of C-arm during hand surgeries, we think that the hand of the surgeons should be more strictly protected.

Keywords: Finger, Radiation, Basosquamous carcinoma, Reversed cross finger flap

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INTRODUCTION

Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are relatively well-studied cutaneous neoplasm types. On the other hand, basosquamous carcinoma (BSC) is a rare epithelial neoplasm with histological features of BCC and clinical characteristics of SCC¹. BSC accounts for 1.5%–2.7% of all cutaneous carcinomas, mostly occurring on the head and neck area¹. At first, BSC was considered to have a characteristic combination of BCC

and SCC without a transition zone, but more recently it has been defined as BCC's transformation into aggressive squamous cells and a type of cancer with a transition zone^{2,3}. In this paper, we would like to report a case study of a rare BSC in radiologist with prolonged radiation exposure found on the dorsum of the finger.

CASE REPORT

A 57-year-old male patient had been suffering from an ul-

cer accompanying bleeding for 8 months on the dorsum of his right fourth finger. The ulcer was round in shape with a diameter of approximately 0.8 cm, of which the margins, including the eponychium, been deepithelized, and the 3 mm center demonstrating white slough (Fig. 1).

The authors assumed that the patient may have been exposed to excessive radiation, given his history of working as a radiologist for 30 years. The authors conducted biopsies on each of the three slices of the specimen collected from the patient, diagnosing it a basal cell carcinoma with focal SCC. Computed tomography was carried out to determine the risk of metastasis and no evidence of remote metastasis to the lung or liver was demonstrated. Wide excision was performed after 5 days.

We performed excision with a 5 mm margin including extensor tendon, and the intraoperative frozen biopsies confirmed that the margins are all negative including tumor base. Proximal distal medial incision was performed. Then the defect on the fourth finger was covered with the lifted flap (Fig. 2). The flap was fixated on the defect area. The cross-finger flap operation was completed by applying a split-thickness skin graft on the raw surface of the

reversed flap. Intraoperatively performed sentinel lymph node biopsies were negative, and the flap was divided 10 days after surgery. The flap survived well, and healed without recurrence for two years (Fig. 3). Because the

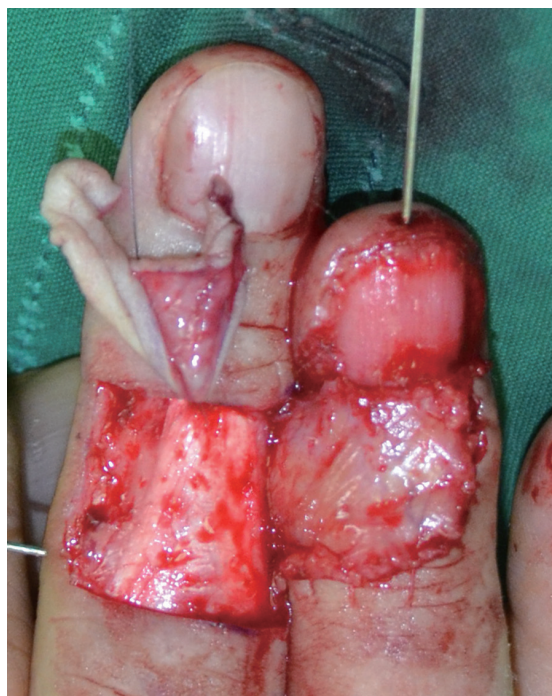


Fig. 2. Covering of the defect with a finger flap lifted from the third finger.



Fig. 1. The 0.8 cm diameter wound on the dorsum the fourth finger.



Fig. 3. The flap survived well, and healed without recurrence for two years.

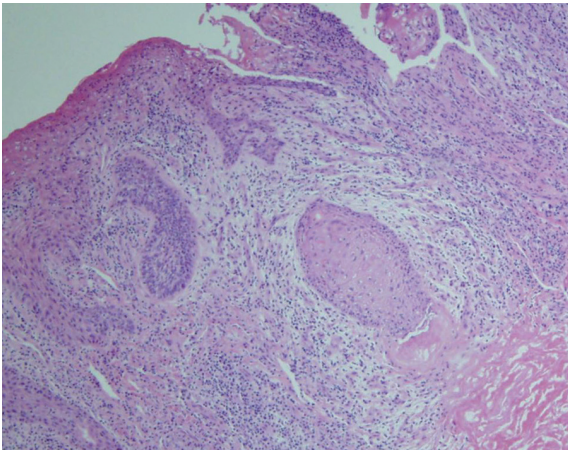


Fig. 4. Basal cell carcinoma blending into areas of squamous cell carcinoma (H&E, ×200).

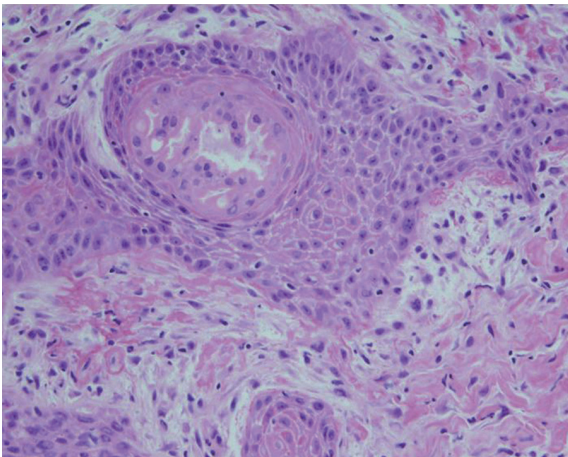


Fig. 5. Basaloid cells, which are slightly larger, paler, and more rounded than the cells of a solid basal cell carcinoma (H&E, ×400).

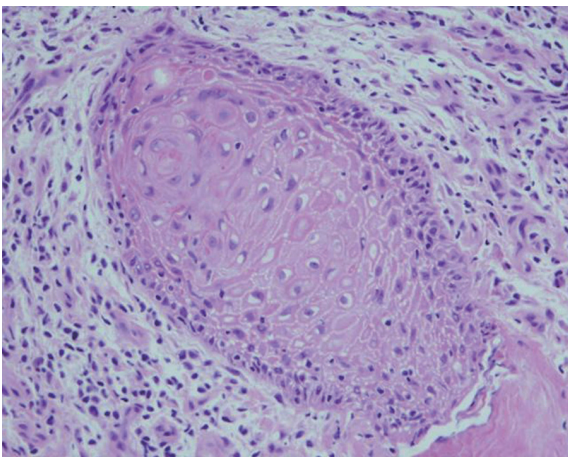


Fig. 6. The area of squamous cell carcinoma characterized by large polygonal squamoid cells with eosinophilic cytoplasm reflecting cytoplasmic keratinization (H&E, ×400).

effectiveness of the adjuvant therapy is debated, we did not apply the adjuvant therapy. Histological analysis on the case suggests that the BSC showed areas of BCC and SCC with a transition zone and the presence of BCC and metatypical BCC blending into areas of SCC (Fig. 4). The basaloid cells were slightly larger, paler and rounder than the cells of a solid BCC (Fig. 5). The area of SCC featured large polygonal squamoid cells with eosinophilic cytoplasm reflecting cytoplasmic keratinization, larger open nuclei (Fig. 6).

DISCUSSION

Wide excision is recognized as the most important treatment for patients with BSC. Multiple image studies must be performed to identify potential metastasis, as it has considerable rates of local recurrence and metastasis. Adjuvant chemotherapy or radiation therapy was sometimes used, although their effectiveness has yet to be proven². There is no certain pathogenesis recommended for BSC, but sunburn is suspected as one of the major causes².

The rare finger BSC case in our study is likely to be linked with radiation, supported by the patient's statement that he had performed numerous radiological tasks without wearing protective equipment on the fingers for 30 years. Because the conventional C arm or the mini C arm is essential for various hand surgeries, the occupational radiation exposure is of concern to hand surgeons. According to Giordano et al.⁴ the conventional C arm is approximately two times the radiation doses during use of mini C-arm. Shoaib et al.⁵ stated that exposures from the mini C arm would allow up to 300 procedures to be performed per year. However, it could be different with Korean situation considering of numerous surgeries and improper protection methods. International Radiation Protection Association (IRPA) set radiation exposure limits; a limit of 20 mSv/year on a whole body and 500 mSv/year on the extremity. According to Kim and Kim⁶, the radiation exposures of Korean trauma surgeons are 7.32 mSv/year in shield aprons and 20.88 mSv/year outside shield aprons. Because the nail bed is more fragile

than other extremities tissues as our case, it could be more reasonable that the nail bed should be protected with not the IRPA limit on the extremity, 500 mSv/year, but the IRPA limit on the body, a 20 mSv/year. Additionally, trauma surgeries without hand lead hand gloves are apt to happen. In this situation hands are likely to be exposed 20.88 mSv/year outside shield apron during surgeries, and radiation exposures could be exceed the whole body limit. Thus, we insist that only the protection apron is not sufficient and the lead hand gloves should be mandatory for hand surgeons.

REFERENCES

1. Wermker K, Roknic N, Goessling K, Klein M, Schulze HJ, Hallermann C. Basosquamous carcinoma of the head and neck: clinical and histologic characteristics and their impact on disease progression. *Neoplasia*. 2015;17:301-5.
2. Leibovitch I, Huilgol SC, Selva D, Richards S, Paver R. Basosquamous carcinoma: treatment with Mohs micrographic surgery. *Cancer*. 2005;104:170-5.
3. Skaria AM. Recurrence of basosquamous carcinoma after Mohs micrographic surgery. *Dermatology*. 2010;221:352-5.
4. Giordano BD, Baumhauer JF, Morgan TL, Rechtine GR 2nd. Patient and surgeon radiation exposure: comparison of standard and mini-C-arm fluoroscopy. *J Bone Joint Surg Am*. 2009;91:297-304.
5. Shoaib A, Rethnam U, Bansal R, De A, Makwana N. A comparison of radiation exposure with the conventional versus mini C arm in orthopedic extremity surgery. *Foot Ankle Int*. 2008;29:58-61.
6. Kim JW, Kim JJ. Radiation exposure to the orthopaedic surgeon during fracture surgery. *J Korean Orthop Assoc*. 2010;45:107-13.

지속적으로 방사선에 노출된 영상의학 전문의의 손에 발생한 기저편평세포암

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기저편평세포암은 드문 상피 종양으로 대부분 두경부에서 발견되며, 손가락에 발생하는 기저편평세포암은 매우 드물다. 저자들은 영상의학과 의사로 활동한 환자의 손가락에서 발생한 기저편평세포암에 대해 종양 절제술을 시행한 뒤 K-강선 고정술과 피부이식술을 동반하여 역교차수지피판술이 시행하여 치료하였다. 이는 방사선과 기저편평세포암과의 연관성을 고려해볼 수 있으며, C-arm를 많이 사용하는 수부외과 의사 역시 방사선에 대한 엄격한 보호가 필요하다고 생각한다.

색인단어: 손가락, 방사선, 기저편평세포암, 역교차수지피판

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