Case Report

Rapidly developed Secondary Cutaneous Squamous cell Carcinoma after Post-Surgical Radiation Therapy for Breast Cancer

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Background: *Radiation therapy is generally accepted treatment of choices for many benign and malignant tumors. A potential late sequela is the development of secondary malignancies around the treated zone.*
Objective: *To report a case of rapid development of a secondary cutaneous squamous cell carcinoma, as a potential adverse sequence of post-radiation therapy.*
Material and Method: *A case report and a literature review are provided.*
Results: *A middle aged woman with locally advanced breast cancer of her left breast developed a secondary squamous cell carcinoma at two years after radiotherapy.*
Conclusion: *A post-radiation cutaneous carcinomas is an uncommon complication of radiation therapy. Diagnosis of the secondary malignancy is often delayed because of its similarities with post-radiation skin lesion or the recurrence of the original tumors.*

Keywords: *Secondary malignancy, Post-operative radiation, Squamous cell carcinoma, Breast cancer*

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Radiotherapy is a widely accepted treatment of choice for many cancers. Radiation therapy may cause both local and systemic side effects such as dermatitis, erythema multiforme, hyperpigmentation and primary non-melanoma skin cancers. However, development of secondary malignancies in and around the treated zone is a potential late sequela of ionizing radiation. Carcinomas are by far the most common neoplasm arising after radiotherapy. Malignant fibrous histiocytoma is the most frequently reported histotype of sarcoma. In addition, osteosarcoma, fibrosarcomas, hemangiosarcomas and malignant schawannomas have also been reported[1-4].

Locally advanced breast cancer has multimodality treatment, including surgical resection with regional nodes treatment, adjuvant or neoadjuvant chemotherapy and post-operative radiation. Development of post-radiation secondary angiosarcoma has been reposted after treatment of breast cancers[5]. Secondary squamous cell cancer (SCC) of the breast is very rare after radiation. Singh et al[6] described SCC of the breast at 12 years after local radiation as a primary adenocarcinoma of the breast. Rapid development of the secondary SCC in the radiation field has never been published. We therefore reported a case of the secondary SCC which arose in the radiation field 2 years later. This study has been approved by the Ethics Committee for Human Research Khon Kaen University (reference No. HE571426) and the patient provided written consent for the use of her images.

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Case Report

In August of 2010, a 35-year-old woman underwent to modified radical mastectomy with axillary lymph nodes dissection for the invasive ductal carcinoma of her right breast at the Provincial Hospital. Subsequently, she had received adjuvant chemotherapy, i.e., CMF (Cyclophosphamide, Methotrexate and Fluorouracil) regimen and was then referred to our center for radiotherapy. In our center, she was provided a total dose of 54 Gy tangential

technique of radiotherapy. She was monitored regularly every three months. In September 2012, the patient had developed a skin mass in the operated field on her right chest wall. Histopathological examination of the biopsied specimen revealed that the tumor was a poorly differentiated SCC. The CT scan showed that the tumor invaded several ribs of her right chest wall. A wide local excision with multiple ribs resection was performed. Her chest wall was reconstructed with prosthetic mesh (inner layer), methylmethacrylate (middle layer) and an omental flap with split thickness skin graft as the outer layer. The pathological report for the surgical specimen revealed a poorly differentiated SCC with ulcer infiltrated into the epidermis, dermis, subcutaneous tissue and underlying ribs. After immunohistochemical examination, the tumor expressed CK5/6 and 34bE12 (Fig. 2); however, estrogen receptor (ER) or progesterone receptor (PR) were negative. The most recent follow-up after three years and six months showed no sign of cancer recurrence.

Discussion

Nowadays, radiotherapy is one of the common treatments of choices for many malignancies, including breast cancer. In cases of locally advanced breast cancer, multimodality treatments are needed such as surgical procedure, chemotherapy, targeted therapy; hormonal treatment and radiation. There are many reports concerning the post-radiation secondary malignancies[1-4]. The most common, secondary malignancies are the groups of soft tissue sarcoma.

Radiation causes basal cell carcinoma but SCC or malignant melanoma has not been reported[7]. The

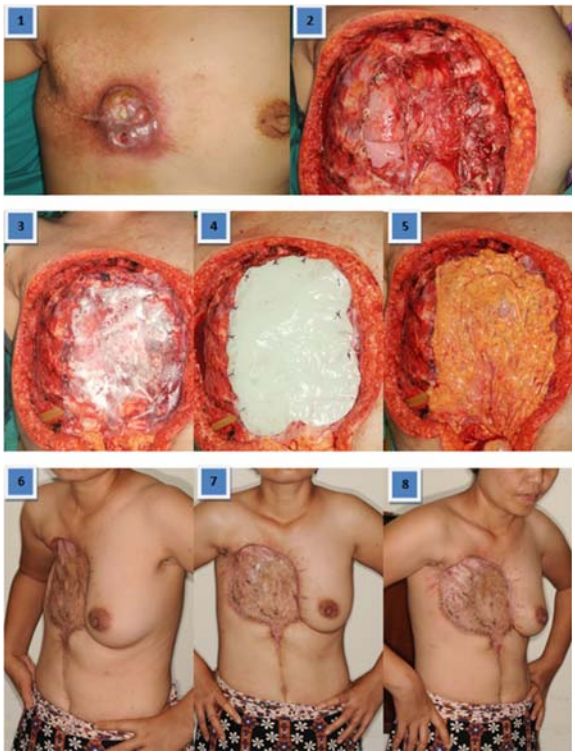

Fig. 1 A 35-year-old woman presented with mass of her right chest wall after modified radical mastectomy and post-operative radiation. Pre-operative lesion (picture 1). A wide local excision of the tumor with rib resection (picture 2). Reconstruction with prosthetic mesh (inner layer, picture 3), methylmethacrylate (middle layer, picture 4) and omental flap with split thickness skin graft (outer layer, picture 5). A recent follow-up at 3.5 years after operation (pictures 6-8) show no recurrence.

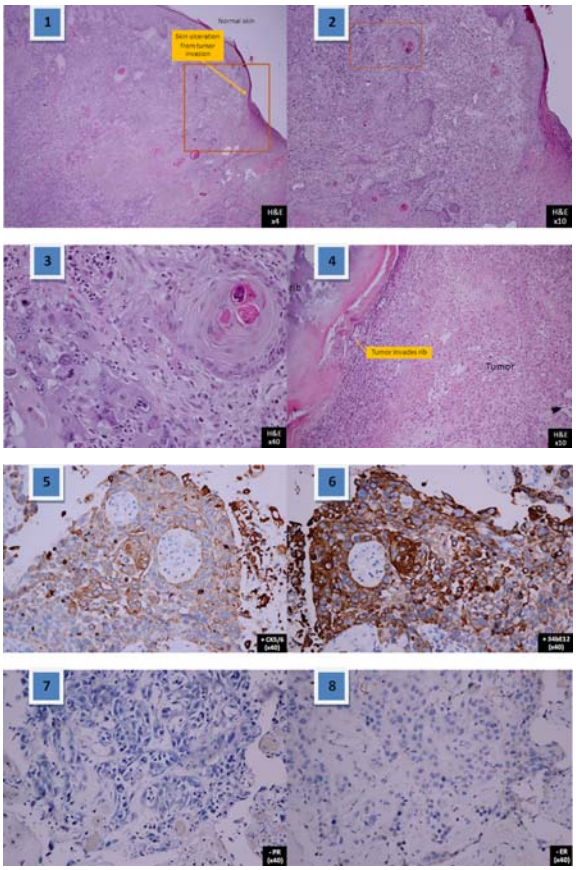

Fig. 2 Histopathological examination of the resected tumor specimen demonstrated squamous cell carcinoma with the skin ulceration and rib invasion (pictures 1-4). The tumor expressed CK5/6 (picture 5) and 34bE12 (picture 6). ER & PR were negative (pictures 7-8).

secondary non-melanoma cutaneous cancers are far from common appearance. A study by Shore[8] reported cutaneous SCC developed at seven years after radiotherapy. There are no reports on secondary SCC earlier to Shore's report.

The case report by this present study is the first of rapid development of cutaneous SCC on the chest wall at only two years after mastectomy with post-operative radiotherapy. In this case, an early diagnosis was difficult because the lesion appeared as complications of the radiation such as radionecrosis or radiation ulcer. A delayed diagnosis might be a part of the reason of local aggressive invasion in this case. We treated this patient with a wide local excision of the tumor and resection of the chest wall, including several rib. The chest wall was reconstructed with prosthetic mesh (inner layer), methylmethacrylate (middle layer) and omental flap with split thickness skin graft (outer layer)[9,10]. This patient had been followed-up for three and half years and fortunately, the patient so far has not shown any signs of recurrence or distant metastasis.

Conclusion

Cutaneous skin cancer may develop early after radiotherapy. The physician should be aware of this possibility during the patients' follow-ups and be able to differentiate the cancer from the skin reactions which resulted from radiotherapy.

What is already known on this topic?

Secondary squamous cell carcinoma of skin after radiation should be recognized and should not be confused with skin complications occurring after radiation treatment. Early detection is ideal for a better prognosis of the disease.

What this study adds?

Radiotherapy is a widely accepted treatment of choice for many cancers. The secondary malignancy, especially squamous cell carcinoma of skin can arise in the early period after treatment although it is an uncommon complication.

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Potential conflicts of interest

None.

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การเกิดมะเร็งผิวหนังชนิดสแควมัสอย่างรวดเร็วภายหลังการฉายแสงเพื่อการรักษามะเร็งเต้านม

เก่งกาจ วินัยโกศล, พลากร สุรกุลประภา

ภูมิหลัง: รังสีรักษาหรือการฉายแสงนั้นเป็นการรักษาในหลาย ๆ โรค ทั้งเนื้องอกและมะเร็งชนิดต่าง ๆ แต่ก็มีภาวะแทรกซ้อนที่ตามมาได้หลายชนิดเช่นกัน รวมไปถึงการเกิดมะเร็งตามภายหลังการฉายแสงในบริเวณที่ได้รับรังสี

วัตถุประสงค์: เพื่อรายงานผู้ป่วยกรณีศึกษาที่เกิดมะเร็งผิวหนังชนิดสแควมัส ซึ่งเกิดขึ้นอย่างรวดเร็วภายหลังได้รับรังสีรักษา

วัสดุและวิธีการ: รายงานผู้ป่วยกรณีศึกษารวมไปถึงการทบทวนวรรณกรรมที่เกี่ยวข้อง

ผลการศึกษา: ผู้ป่วยหญิงวัยกลางคนที่มาเข้ารับการรักษาด้วยมะเร็งเต้านมระยะลุกลาม ภายหลังจากได้รับการรักษาโดยการผ่าตัด ยาเคมีบำบัด และการฉายแสง พบว่าเกิดมะเร็งผิวหนังชนิดสแควมัสอย่างรวดเร็วภายหลังการฉายแสงเพียง 2 ปี

สรุป: การเกิดมะเร็งผิวหนังชนิดสแควมัสภายหลังการฉายแสงนั้นพบได้น้อยมากและอาจทำการวินิจฉัยได้ยากหรือล่าช้า เนื่องจากอาจเกิดความสับสนว่าเป็นผิวหนังอักเสบภายหลังการฉายแสงหรือแม้แต่สับสนกับตัวโรคเดิมที่อาจกลับมาเป็นซ้ำได้