**A patient presenting with an advanced squamous cell carcinomas to the left thigh**

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**Abstract** Introduction: In Australia, Squamous Cell Carcinomas (SCC) are the second most common form of skin cancer and is most frequently present in the population aged 50 years and older. SCCs account for 31% of all skin cancers that are reported in Victoria. Between 1999–2004 there were 11,500 new cases of SCCs in Victoria, with 65% of those cases being found in the male population and 16% of these cases occurring on the lower limbs. These figures are most likely underestimated as SCCs are one of two cancers not classed as a legally notifiable disease and most are diagnosed and treated by general practitioners. The National Cancer Control Initiative (NCCI, 2002) reported that approximately 118,000 people with SCC were treated in Australia during 2001 with 71,000 of these people being male. The age adjusted incidence for SCC in Australia for the general population has been calculated at 1332 of 100,000 people. This is most likely as a result of the lifestyle differences between the two countries.

SCCs characteristically are slow growing tumours, but are known to enlarge rapidly in some cases. Apart from presenting with a lesion, patients are usually asymptomatic. Symptoms of advanced disease include bleeding, weeping and pain or tenderness, especially with larger lesions. Numbness, tingling or muscle weakness may also reflect underlying perineural involvement. Surgery is considered the gold standard for treating SCCs.

Case presentation: A male patient in his late forties presented to clinic with a 25 cm fungating SCC lesion to the left upper thigh. Radiation therapy treatment via non coplanar beams was prescribed to treat the lesion to 66 Gy in 33 fractions. Chemotherapy was not an option due to the patient’s co-morbidities. This case report follows the patient from the start to 84 weeks post treatment. Conclusion: The patient discussed in this case report found the treatment process and overall outcomes were satisfactory despite the advanced presentation of the disease and anxieties about hospitals and medical staff. The radiation therapists involved in this patient’s treatment process found the case challenging, and it gave them the opportunity to utilise their skills and knowledge to approach the case with a range of alternative techniques. In this case, treatment achieved the desired outcome for the patient.

**Keywords:** advanced SCC, case report, thigh.

**Introduction:**
In Australia, Squamous Cell Carcinomas (SCC) are the second most common form of skin cancer and is most frequently present in the population aged 50 years and older. SCCs account for 31% of all skin cancers that are reported in Victoria. Between 1999–2004 there were 11,500 new cases of SCCs in Victoria, with 65% of those cases being found in the male population and 16% of these cases occurring on the lower limbs. These figures are most likely underestimated as SCCs are one of two cancers not classed as a legally notifiable disease and most are diagnosed and treated by general practitioners. The National Cancer Control Initiative (NCCI, 2002) reported that approximately 118,000 people with SCC were treated in Australia during 2001 with 71,000 of these people being male. The age adjusted incidence for SCC in Australia for the general population has been calculated at 1332 cases per 100,000 people. This is most likely as a result of the lifestyle differences between the two countries.

SCCs characteristically are slow growing tumours, but are known to enlarge rapidly in some cases. Apart from presenting with a lesion, patients are usually asymptomatic. Symptoms of advanced disease include bleeding, weeping and pain or tenderness, especially with larger lesions. Numbness, tingling or muscle weakness may also reflect underlying perineural involvement.

Surgery is considered the gold standard for treating SCCs. When surgery is not feasible, other treatment options include topical chemotherapy, topical immune response modifiers, photodynamic therapy (PDT), radiation therapy and systemic chemotherapy. Radiation therapy is the treatment of choice when surgery is not feasible due to cosmesis, metastatic disease, high risk cutaneous disease or as an alternative to surgery particularly in elderly patients. Systemic chemotherapy is only used when metastatic disease is present. Topical therapies are generally limited to premalignant lesions.

**Case presentation:**
In September 2007, a male patient in his late forties presented for medical attention at his local hospital with increasing lethargy and diminished mobility. The patient is of university level education that lives alone in a rural location and is estranged from his immediate family. He is an ex-smoker of seven years with a previous history of 20 cigarettes per day coupled with a significant history of poor nutrition. He also had a previous history of depression and anxiety with a long standing fear of doctors and hospitals. The patient had been diagnosed in the past with chronic liver disease of unknown aetiology, having given no convincing history of excessive ethanol abuse. Examination revealed an advanced ulcerating and fungating lesion to his upper left thigh that had been present for 10 years before presentation (Figure 1). A biopsy of the lesion confirmed a SCC.

At his initial consultation with a Radiation Oncologist (RO) in October 2007, the lesion was measured to be 25 cm in diameter. A Positron Emission Tomography (PET) and Computed Tomography (CT) scan were ordered and performed. The PET scan showed an active inguinal node on the left side that was asymptomatic at the time. The surgical treatment option required amputation of the limb due to the extent of the disease. However, the patient was averse to losing his limb and declined surgery.
Concomitant chemotherapy was not recommended due to the patient’s co-morbidities. In late November 2007, the patient was diagnosed as having incurable disease based on his history and the extent of disease by the treating RO. After discussion with the patient, high dose palliative radiotherapy to the lesion on his left thigh was chosen as the preferred treatment option. The patient was prescribed a dose of 60 Gy in 30 fractions (Fx). The inguinal node was not for treatment at that stage as it was not causing the patient any issues and the benefit gained would not warrant the undesirable side effects of treatment.

The patient was simulated on the AcQsim™ (Philips, North Ryde, NSW, Australia) single slice CT scanner. The scanning area started from the top of his iliac crest to below his left knee. Scan parameters consisted of 0.5 cm thickness and slice spacing. The patient was positioned with the affected leg raised to enable beam directions to avoid the contralateral leg. Radiotherapy was planned with two oblique, unopposed beams with the addition of two field-in-field beams. Due to the 31 cm length of the primary fields, wedging was not possible; the field-in-field arrangement was used to achieve a homogeneous dose distribution.

Pre-treatment Electronic Portal Images (EPI) were taken to verify field placement and field borders were drawn on his skin and photographs taken for future reference. The RO requested that a margin defined by the light field of 2 cm on the visible lesion was to be maintained on a daily basis. EPIs were not taken after the first fraction as they were deemed not to be technically relevant to this treatment technique, as the field margin was to be verified visually on a daily basis. The addition of 1 cm bolus was required over the whole treatment area.

On the 28th fraction, the RO reviewed the patient in clinic and made the decision to treat the lesion to 66 Gy in 33 Fx as the lesion had responded well to the treatment.

The patient completed his treatment in January 2008 and was reviewed three weeks after this, having tolerated the treatment very well. On examination at this time, the peripheral edges of the tumour appeared to have regressed somewhat with increased skin coverage at the margins. The central necrotic area remained unchanged (Figure 2). Overall, the region appeared clean with no evidence of cellulitis and he was continuing with daily dressings of Solugel™ (Johnson and Johnson, New Brunswick NJ, USA) and Metronidazol. Clinical examination of the leg revealed no lymphadenopathy peripherally but the palpable inguinal node, measuring roughly 2 cm in diameter, was still present.

At the six-week post treatment review with the RO in March 2008, there had been no improvement in the patient’s mobility. There was a significant amount of sloughing still present in the centre of the lesion. Although most edges of the tumour were noted to have significantly flattened, there was still some nodularity on the lateral aspect of the lesion. There was mild pedal oedema below the knee on examination. The patient was pleased.
to see the reduction in size and decreasing smell of the lesion.

At the 25 week post treatment review with the RO in July 2008, the lesion measured 14 cm x 15 cm; however on the lateral edge there was a definite indication of proliferative tumour, suggestive of early stages of disease progression (Figure 3). The RO discussed the options available to the patient if the disease progressed further. After discussion, the patient and the RO decided to monitor the lesion until the patient’s next review.

At the 44-week review with the RO in December 2008, the lesion itself had increased, to measure 17 cm in diameter, with further progression of the disease on both the lateral and medial margins. There were also new areas of skin on the periphery of the lesion in places. Along with the new skin forming around the lesion, the patient had been experiencing more frequent sensations in the lesion area. A decision was made to observe the lesion until the patient’s next review.

At the 52-week review with the RO in January 2009, the lesion had progressed and was measuring 18 cm in diameter. At this point there was increased peripheral bleeding from the lesion and the patient had noticed more discharge from the lesion itself as well (Figure 4). After discussion between the patient and the RO, the decision to retreat the lesion was made. A dose of 20 Gy in 10 Fx to the medial and lateral aspects of the lesion was prescribed.

The patient was simulated in the previous treatment position. He was planned and re-treated in February 2009 with tangential fields to the medial aspect of the thigh and tangential fields to the lateral aspect of the thigh with 1 cm gap between the fields at depth. This was to treat the skin and minimise the dose to the bone as much as possible. Build-up of 1.5 cm using wet towels was used over the entire fields.

At the 70-week post treatment review with the RO in June 2009 (17 weeks post re-treatment), the lesion had shown signs of regression with further regrowth of skin on the inferior lateral aspect of the lesion. The lesion measured 18 cm in diameter. The patient noted increased stiffness in his leg due to the ongoing progression of his fibrosis and oedema at the treatment site. There was found to be no obvious progression of his inguinal lymphadenopathy. The patient was using compression bandages along with physiotherapy sessions to maintain his mobility.

At the 84-week post treatment review with the RO in September 2009 (31 weeks post re-treatment), the lesion remained stable (Figure 5). Since the 70-week review, the patient had been admitted to the hospital where he was given antibiotics for infection. Biopsies were also performed and confirmed residual SCC. Examination of the nodes indicated their growth, however were not causing any symptoms.

Discussion

This case presentation was interesting as it is unusual to find an advanced lesion when awareness of skin cancer and treatment options are now more readily accessible. The pertinent issues in this case were:
Patient anxiety: the patient’s reluctance to seek treatment was due to his anxiety towards health practitioners. This reluctance was later established to be due to past experiences with health practitioners.

Access: the patient’s access to a treatment facility could have also been an issue as the Bendigo Radiation Therapy Centre became clinical in 2002. Therefore, the lesion had been present for five years before a local facility was available. Previously the nearest centre was located 129 km south, in Melbourne, Australia.

Stabilisation issues: the stabilisation technique for this patient was employed in order to move the unaffected leg out of any possible beam arrangement and to also try and ensure some skin sparing of the patient’s affected leg was possible. As the patient had restricted movement of the affected leg, this was only partially achieved through patient positioning at simulation; these aims were further achieved with the selected beam arrangement at the time of planning. The use of a vac bag and tattoos, ensured the patient’s setup was reproducible for a limb (Figure 6).

Planning issues: the RO marked a volume of interest to be covered. The plan that was selected to treat the patient’s lesion was chosen to allow skin sparing to normal tissue of the affected leg in order to preserve lymphatic drainage (Figure 7).

Dose issues: the patient received a dose of 66 Gy in 33 Fx in late 2007. When the patient presented for re-treatment, the RO considered many factors before prescribing the dose. These factors included “forgotten dose” estimated to be 20% of 66 Gy (13.2 Gy), the patient’s overall life expectancy given the presence of nodal involvement, skin dose tolerance in the treatment area and the possible early and late effects from the re-treatment. The patient then received 20 Gy in 10 Fx in early 2009 which gave a total Biological Effective Dose of approximately 72.8 Gy in 43 Fx to the treatment area.

Patient care: this was a significant factor in this case as there were many issues related to the patient’s history, disease and personality. The treating RTs had to recognise and work with the patient to overcome some of these issues. As staff, we were able to use a range of communication techniques that enabled the patient to communicate with us beyond his comfort zone. This increased the patient’s compliance with all treatment related instructions and post treatment recommendations from the RO.

Patient response: the patient considered the lesion’s initial response to the treatment to be a positive outcome. The reduction in the size and odour of the lesion was an unexpected outcome of the treatment for the patient. The negative outcome for the patient was the reduction of mobility in the affected leg post treatment.

Patient mobility: although this improved slightly after the initial treatment reaction had settled, the patient found that it decreased as time passed. Consequently, the patient had to continue his physiotherapy sessions in order to maintain his current level of mobility. Other causes of the patient’s mobility issues were the ongoing progression of his radiation fibrosis and oedema as a result of the radiation therapy. Although surgery is the prefer-
able treatment option in advanced SCCs, it was noted that at the conclusion of the patient’s treatment, his mobility was possibly better than if an amputation of the affected limb was performed.

**Lifestyle:** throughout the patient’s treatment and follow up, the patient maintained his normal daily activities. He was independent and relied on district nursing for dressings a few times a week. The patient has continued with the physiotherapy sessions that enabled him to maintain functionality and independence. He also had to give considerable thought to his working future, but at the time of publication had not made a decision.

**Conclusion**

The patient discussed in this case report found the treatment process and overall outcomes were satisfactory, despite the advanced presentation of the disease and anxieties about hospitals and medical staff. The radiation therapists involved in this patient’s treatment process found the case challenging, and it gave them the opportunity to utilise their skills and knowledge to approach the case with a range of alternative techniques. These included, but were not limited to, communication skills. The patient was almost reclusive upon entering the department. However, the staff was able to use their considerable skills to involve the patient in all aspects of his treatment to gain his trust in their professionalism and knowledge. The planning staff was able to use their knowledge of what the patient was capable of for his setup, the treatment machine’s capability and the overall reproducibility to ensure that the patient received the most optimal treatment. Similar cases can be treated with relative success, but will require much individualised treatment approaches to offer the best outcomes for patients. The treatment intent for the patient was never curable, but focused on achieving the best outcome for the patient. In this case, the intent was to reduce the size and growth of the primary lesion, minimize the odour and most importantly, preserve the patient’s lifestyle. In this case, treatment achieved the desired outcome for the patient.

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**References**