

# Cyclical Pressurized Topical Oxygen Therapy For The Treatment Of Late Effect Radiation Wounds



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## Introduction

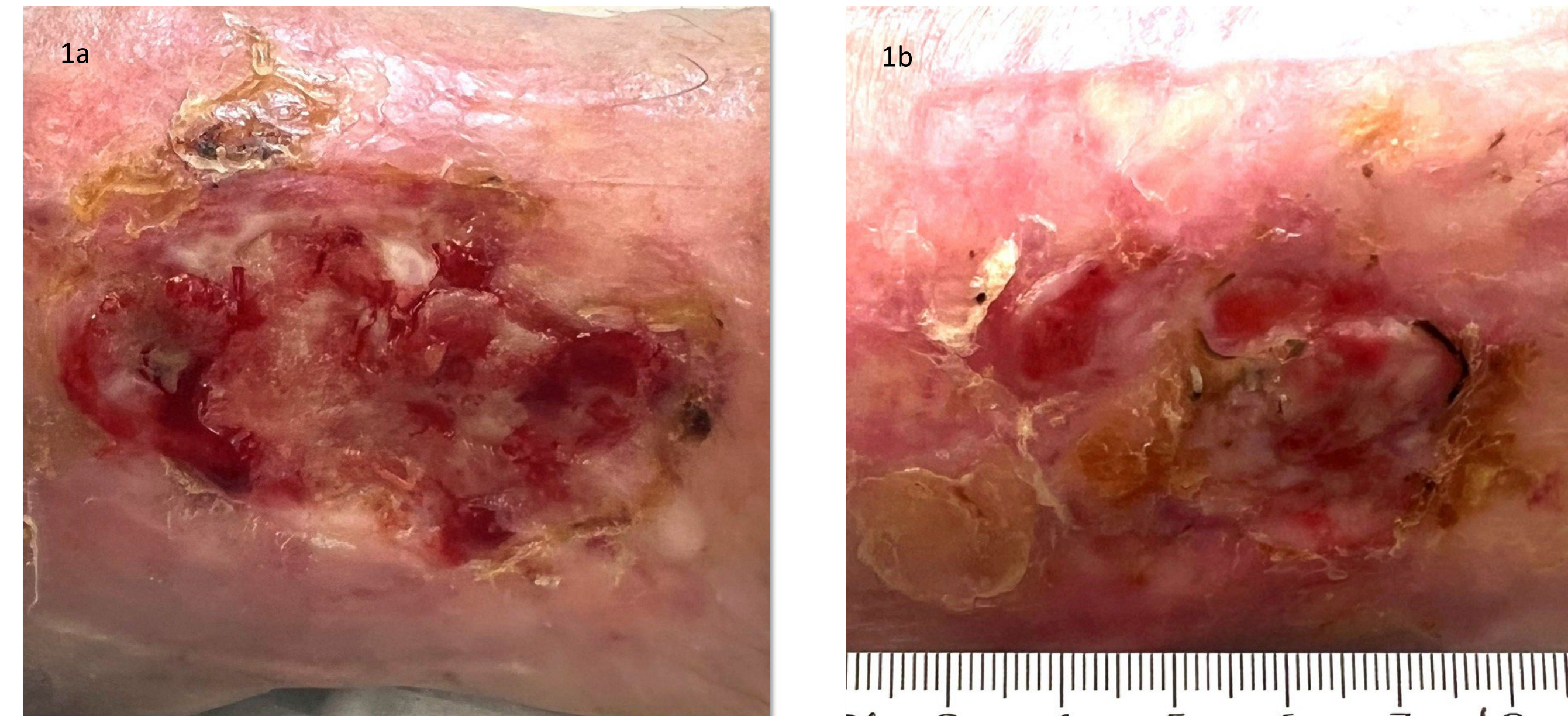
Impaired wound healing is a challenging problem in patients treated with radiation therapy. Radiation damages the cell's DNA and ability to replicate and function normally, increases oxidative stress and destroys small vessels, leading to a prolonged inflammatory response, fibrosis and ischemia. Complete excision and pedicled or free flap reconstruction is thought to be the most successful treatment; however, it requires access to surgeons with appropriate experience/skill and often requires multiple-stage surgeries and prolonged hospitalization and is associated with high complication rates and significant donor site morbidity.<sup>1</sup> For some patients, a surgical approach may not be appropriate or feasible.

Topical oxygen therapies, delivered in an outpatient or home setting, have been shown to increase oxygen levels in wound tissues, upregulate VEGF, increase angiogenesis, accelerate wound closure and improve collagen synthesis and remodeling.<sup>2-6</sup> Cyclical pressurized topical oxygen therapy (TWO<sub>2</sub>)\*\* has the added benefits of: 1. providing O<sub>2</sub> under pressure, which delivers a greater concentration of oxygen to the tissue and 2. cyclical, non-contact compression, alternating between 8.5 and 38.5 mmHg, which decreases edema and improves local perfusion.

## Methods

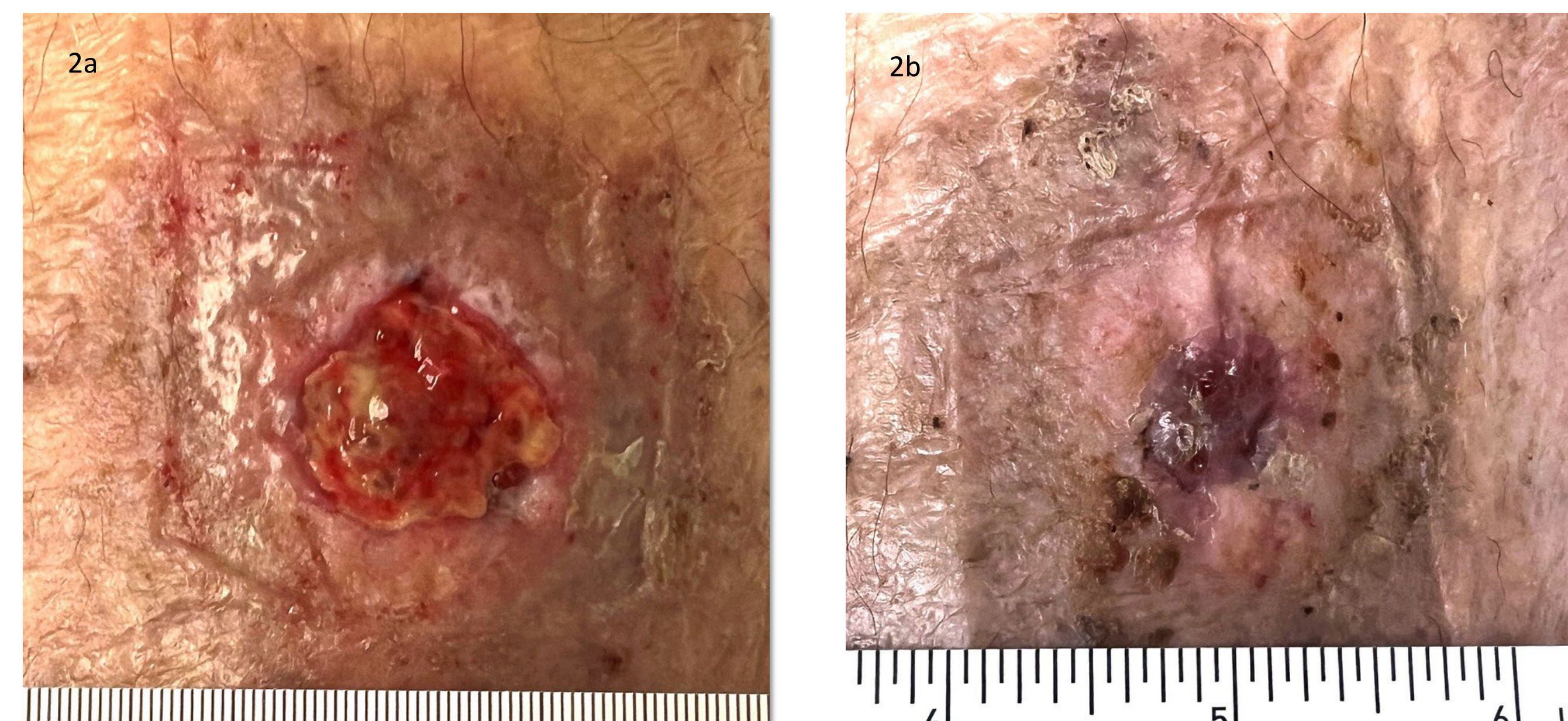
This case series describes the use of TWO<sub>2</sub> for the treatment of late-effect radiation wounds in two medically complex patients with multiple comorbidities and limited access to healthcare services. Both patients had been treated with radiation therapy for skin cancer. Case one involves a 76-year-old female, with a five-year history of recurrent right, medial ankle ulceration, complicated by lupus and chronic venous insufficiency. Case 2 involves a 78-year-old male with a left, anterolateral leg ulcer, present for 10 months, complicated by chronic venous insufficiency. Prior to initiation of TWO<sub>2</sub>, both patients had been treated with standard of care for at least two months, including debridement, edema management, moist wound dressings and appropriate medical management, with little wound improvement. The patients self administered TWO<sub>2</sub> therapy, 5 days a week, 90 minutes per session, within the comfort of their own homes.

Figure 1



1a. Week 0; 1b. Week 24

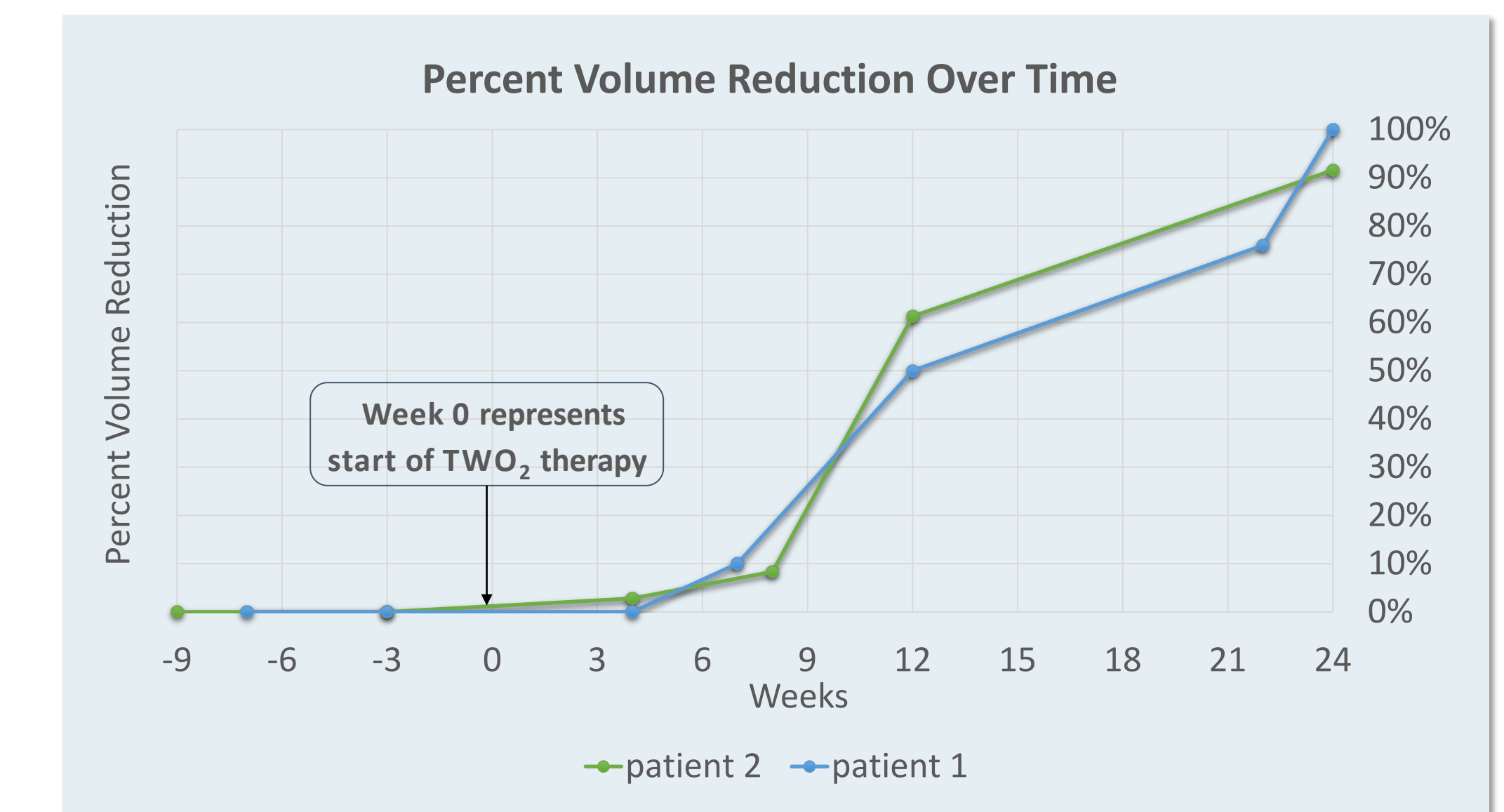
Figure 2



2a. Week 0; 2b. Week 24

## Results

Percent volume reduction was 61% at 12 weeks and 92% at 24 weeks for patient 1 and 50% at 12 weeks and 100% at 24 weeks for patient 2. Wound exudate and inflammation were reduced with treatment and both patients reported decreased pain. It is interesting to note that the trajectory of wound volume reduction accelerated around week 8 for both wounds.



## Conclusion

TWO<sub>2</sub> was effective in decreasing pain, improving wound bed vascularity and achieving significant wound size reduction, in two medically complex patients with late-effect soft tissue radiation injury, who were refractory to standard of care and had few other options for treatment.

## References

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