Radiation Induced Morphea

A case series and literature review

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INTRODUCTION

Morphea, alternatively known as localising scleroderma, induced by radiation of the breast is rare with an estimated incidence of 0.20%[1]. To date there have been only been 82 cases of radiation induced morphea reported in the literature however some argue the rates of incidence are higher in this condition that is under diagnosed and so prevalence may be underestimated[2].

There is limited data pertaining to patient characteristics that increase the risk of development of radiation induced morphea. In generalised morphea the prevalence is four times more likely in those with underlying autoimmune disease in their family history[3] yet it is unknown if this extends to those who develop morphea in response to trauma. Morphea may occur in months to years post radiotherapy[4], up to 32[5] years has been reported following treatment affecting areas including and even remote from irradiated tissue. Morphea may resolve spontaneously with 50% of cases moving into a state of abeyance within 2.7[7] years following onset of disease yet patients may be left with pain, pigment changes, contracture with deformity and atrophy.

THE CASES

We report two cases of radiation induced morphea in the radiotherapy field who received radiotherapy following breast-conserving surgery.

A 61 year old female who underwent a right sided wide local excision and sentinel lymph node biopsy for a 3cm lesion. Background included hypothyroidism, depression and ongoing smoking. Histopathology was ER/PR positive, HER2 negative. Adjuvant radiotherapy consisted of 50Gy in 19 fractions, phase two burst, with mild skin reaction at time of radiotherapy. Chemotherapy and hormonal therapy consisted of letrozole, tamoxifen then letrozole. 5 months post radiation therapy, mild oedema commenced throughout the radiotherapy field worsening over the next 6 months to moderate oedema. 15 months post initial radiotherapy Morphea was diagnosed manifested clinically as axillary ulcerations. Histopathology demonstrated chronic inflammation/fibrosis, mammography and USS demonstrated no cancer recurrence. Connective tissue disorder screens were negative. Oral corticosteroids resulted in ulcerations healing and the morphea is stable at 1 year. Our second patient is a 71 year old female who also underwent a right sided wide local excision and sentinel lymph node biopsy for a 15cm mass. Background included moderate aortic regurgitation, arthritis and gastro-oesophageal reflux. Histopathology was ER/PR/HER2 positive. Chemotherapy and hormonal therapy consisted of paclitaxel, trastuzumab, anastrozole. Radiotherapy consisted of sequence boost radiotherapy phase I 42.5Gy/16F, phase II 10Gy/4F. Morphea was diagnosed 13 months post surgery with breast and axillary ulceration, contraction and atrophy. No cancer recurrence was demonstrated on imaging but but histopathology demonstrated chronic inflammation with oeosinophilia. Prednisolone was administered with resolution of symptoms 6 months later which has remained stable at 5 years.

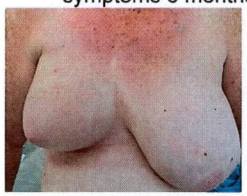

Figure 1. Anterior view at onset of symptoms.

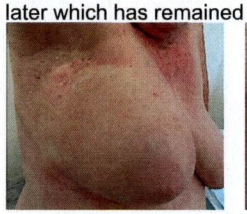

Figure 2. Lateral view at onset of symptoms.

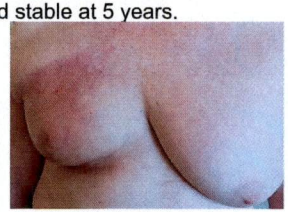

Figure 3. Anterior view following treatment.

DISCUSSION

The pathogenesis of radiation induced morphea is not completely elucidated. Theories primarily based on those describing generalised morphea describe a complex interaction of underlying genetic susceptibility, epigenetic and triggering environmental insult such as radiation[8]. Neoantigen production[9] generating an autoimmune reaction predominantly a Th2 response[10] likely contributed to by vascular disfunction leads to inflammation affecting mesodermal derived tissues[11] with TGF-beta release[12] activating fibroblasts, leading to dysregulation of collagen deposition, fibrosis, sclerosis and eventually atrophy[13]. As is demonstrated in our cases recurrent inflammation as was presented as ulceration leads to fibrosis, contracture and volume loss (see figures 1-3).

Histopathological diagnosis early in the inflammatory phase is essential to modulate of the inflammatory response leading to improved outcomes[14].

Alternative diagnoses need to be excluded including recurrence of cancer and there is a common confusion with late onset radiodermatitis that effects up to 95% of patients following radiotherapy[15]. Morphea histopathology is pronounced thickened dermis and fibrosis extending into the underlying fat with panniculitis and pronounced perivascular inflammation[3].

Best results are obtained if treated within 3 months of onset consisting of topical calcipotriene or tacrolimus or phototherapy, continued progression may allow for the addition of methotrexate or systemic corticosteroids[13] as our patients were treated.

Once stable inactive disease is present there is minimal evidence for systemic therapy. There are reports of surgical reconstruction for morphea demonstrating good cosmesis[16] but it is unknown if this has the potential to reactivate the inflammatory phase[13].

CONCLUSION

When treating radiation induced morphea of the breast, early diagnosis and treatment is imperative to successfully halt the inflammatory process and potentially reverse the early changes apparent in this disease. Once established disease is apparent with sclerotic lesion resolution is unrealistic.

The authors of this poster have no conflicts of interest to declare.

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