Tolerability of Breast Radiation Therapy in the Setting of Mondor Disease

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Introduction

Mondor disease is a rare condition associated with thrombophlebitis of the superficial veins, named after Henri Mondor, a French surgeon who described the disease in 1939.1 It is most commonly seen in the breast, though it can also be seen in the penile veins (penile Mondor disease)2 or in the groin, antecubital fossa, and posterior cervical region.3 In the breast, Mondor disease often involves 1 of 3 venous channels: the lateral thoracic, thoracoepigastric, or superior epigastric veins.4 Typical manifestations may include pain, erythema, and dimpling, while arm elevation may create a groove in the breast (Fig. 1). The disease appears 3 times as frequently in women as in men, and mostly in patients 30 to 60 years of age.5

The exact physiological mechanism of Mondor disease is not known, with approximately 50% to 60% of cases classified as “idiopathic,” while 40% to 50% of cases have suspected causes.5 Suspected etiologies of Mondor disease include injury, surgical trauma, infection, muscular strain, large pendulous breasts, tight clothing or bandages, carcinoma, adenopathy, radiation, lymphangitis, intravenous drug abuse, and shaving.5 The incidence has been estimated to be between 0.95% to 1.07% of oncologic breast cases and esthetic mammoplasties.7

Radiation was listed as a possible cause by Pugh et al6 and reported in a case report developing after whole breast radiotherapy.8 Although radiation has been reported as a possible cause of de novo Mondor disease, there is little known about the clinical course in a patient with preexisting Mondor. The typical course of Mondor disease is benign and commonly resolves without significant intervention required. However, the fear of recurrent pain and cosmetic changes could influence decision making, pushing patients to forego the needed radiation after lumpectomy or influencing patients to opt for mastectomy to avoid possible exacerbation of Mondor disease with radiation. In this article, we report on a patient with ductal carcinoma in situ (DCIS) of the breast diagnosed with Mondor disease who subsequently received adjuvant radiation therapy.

Case Report

A 62-year-old Japanese woman presented secondary to a palpable mass in the left (contralateral) breast, but subsequent mammogram demonstrated suspicious calcifications in the upper outer quadrant of the right breast. No mammographic or sonographic abnormalities were visualized at the original site of palpable concern in the left breast. Subsequent right biopsy demonstrated a grade 3 DCIS with necrosis, solid and comedo type, which stained...
positive for estrogen receptor and negative for progesterone receptor.

Approximately 1 month after her initial right breast biopsy, Mondor disease was diagnosed in the patient, extending from the right lateral breast down to the upper abdominal wall. Physical examination demonstrated a palpable and minimally tender right lateral breast cord extending inferiorly to the upper abdomen without overlying skin changes.

Symptoms improved with warm compresses and around-the-clock ibuprofen. The patient subsequently underwent a right breast wire-guided lumpectomy a little over 1 month after initially being diagnosed with Mondor disease. Pathology at that time demonstrated a 21-mm grade 3 DCIS with necrosis, expansive comedo type necrosis. The closest margin was 4 mm.

Postoperatively, the patient described exacerbation of Mondor disease, which manifested as a band of tightness along the right lateral aspect of her breast. By radiation therapy consultation 4 weeks after her lumpectomy, the Mondor disease was improving but still present, causing pain up to 2 to 3 out of 10 in severity along with visible cording along the right lateral aspect of her breast when she raised her right arm (Fig. 2).

Figure 1 Illustration of Mondor disease (reproduced with permission from Elsevier).
The patient subsequently underwent adjuvant radiation therapy, receiving 4256 cGy to the right breast in 16 fractions over 21 days using a tangential technique with 6 and 10 MV photons. No boost dose was delivered. She tolerated the course fairly well with some itching and soreness of the skin. Her skin exhibited mild hyperpigmentation at the end of radiation therapy, but no desquamation. The Mondor disease continued to improve through the radiation therapy, and by the end of radiation therapy, the cording along the right lateral aspect of the breast was barely visible (Fig. 3).

One month after the end of radiation therapy, her skin still exhibited minimal hyperpigmentation, with the right lateral breast cording still not palpable but barely visible (Fig. 4).

**Discussion**

The exact etiology of Mondor disease is not always known, but trauma, surgery, and cancer appear to correlate with the disease.6,9 This patient’s Mondor disease affected the lateral thoracic vein, which is reported to be the one more commonly affected.10

The clinical course of Mondor disease is typically benign without significant long-term sequelae. No particular treatment is required, as the disease typically spontaneously resolves within 4 to 8 weeks,11 but nonsteroidal anti-inflammatory drugs can help relieve the symptoms.12 In this case, the patient used warm compresses and ibuprofen twice daily, resulting in significant improvement in her symptoms within approximately 4 weeks after her biopsy as well as within approximately 4 weeks after her postsurgical exacerbation.

Radiation therapy has been listed as a possible cause of Mondor disease5 and has been linked as a possible inciting factor in a case report.8 Given the inflammation associated with radiation therapy, it is plausible that radiation might cause or exacerbate preexisting Mondor disease. With the existing literature suggesting radiation can cause Mondor disease, patients with Mondor disease may fear radiation and decline recommended treatments. More literature demonstrating radiation therapy safely delivered to a patient with Mondor disease can help assuage those fears. To our knowledge, there have not been previous

**Figure 2** Illustration of Mondor disease in this patient 1 month after lumpectomy and before radiation therapy (with subcutaneous cord of the lateral thoracic vein drawn in blue) (A) and the same image without blue markup (B). (B, C) Manifestation of Mondor disease in this patient 1 month after lumpectomy and before radiation therapy. Disease is visible when arm is raised.

**Figure 3** Manifestation of Mondor disease in this patient at the end of radiation therapy.
reports describing the sequelae of whole breast radiation therapy in a patient recovering from Mondor disease. This patient’s radiation therapy did not exacerbate her underlying Mondor disease or hinder her recovery. Although we cannot rule out the radiation slowing down the resolution of Mondor disease, radiation therapy was safely delivered in this patient with preexisting Mondor disease.

However, additional data are still needed to determine the tolerability of radiation therapy in all patients with Mondor disease. Aside from being unable to make broad conclusions based on a single case, we also cannot exclude this patient’s Mondor disease recurring in the future. However, she developed Mondor disease within weeks after the biopsy and had exacerbation within weeks after the surgery. This patient exhibited improvement during the treatment and no evidence of exacerbation 1 month after the radiation.

Additionally, this patient’s symptoms at the end of whole breast radiation therapy appeared to be minimal, so it is possible a patient with more prominent acute radiation effects may have experienced recurrence or exacerbation of their Mondor disease.

### Conclusion

Despite the suggestion of radiation therapy as an underlying cause of Mondor disease, whole breast hypofractionated radiation therapy did not appear to exacerbate or hinder recovery from Mondor disease in this patient. Given the limited literature describing radiation therapy in the setting of preexisting Mondor disease, this report, along with future articles, may help solidify the tolerability of whole breast radiation therapy in a patient with Mondor disease.

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**Figure 4** Manifestation of Mondor disease in this patient 1 month after radiation therapy.