Radiological Indications and the Role of Cryoablation in the Management of Fibromatosis

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Background

Fibromatosis represents a group of histologically benign but locally aggressive soft tissue tumors, that are typically categorized into "superficial" and "deep" tumors.[1,2] Superficial tumors are further divided into palmar, plantar, and penile tumors, and deep fibromatosis is characterized by more aggressive behaviour.[3,4,5,6]

Although fibromatosis is non-metastatic, it can cause pain and functional impairment by invading the local tissue.[3] Surgical resection remains a common treatment, however, tumour recurrence rates are high.[7] Recently cryoablation has emerged as a minimally-invasive therapeutic option, demonstrating promising safety and efficacy.[8]

Methods

A literature search was conducted using PubMed and Google Scholar, including articles written in English, and published between January 1st 2000 to December 31st 2024. The keywords included "fibromatosis" OR "desmoid tumor" OR "superficial fibromatosis" OR "deep fibromatosis" and "radiology" OR "imaging".

Results

On ultrasound, 98% of palmar fibromatoses presented a hypoechoic appearance, while only 2% of tumors showed a predominant isoechoic characteristic.[9] On MR imaging, the tumor presents as an ill-defined intermediate signal area.[10]

Plantar lesions primarily present as hypoechoic masses, while some studies reported mixed echogenicity.[11] Desmoid fibromatoses frequently demonstrated hypoechoic characteristics.[12]

Even after surgical excision, these lesions have a high recurrence rate. While aggressive fibromatosis can undergo chemotherapy or radiotherapy, there are several patient complications in these treatments.[8] Cryoablation is an emerging therapeutic intervention, that damages the cellular structures of the tumor through formation and thawing of intracellular ice.[8]

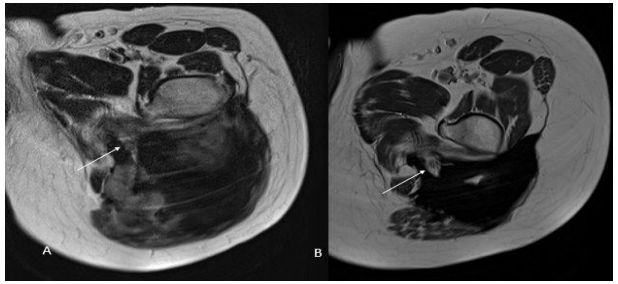


Fig 1. T2-weighted images pre- and post-cryoablation in a 65-year-old patient, showing reduction in tumor size within the gluteal region. (A) Before cryoablation therapy, the tumor shows a heterogeneous T2 signal. (B) Post-treatment image demonstrates diffuse fibrosis with decreased tumor size and reduced mass effect on the sciatic nerve (seen as the arrow).

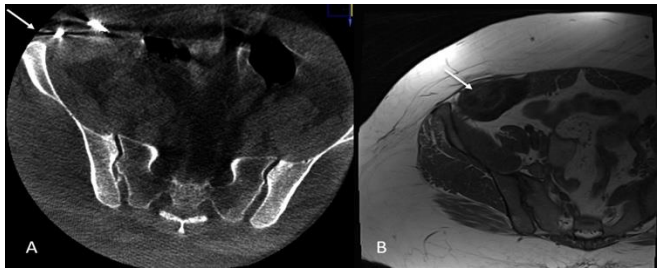


Fig 2. (A) CT image of 56-year-old patient undergoing cryoablation of a right lower anterior abdominal wall lesion. (B) T1 weighted image at six-week follow-up shows intralesional high signal intensity (arrow), consistent with central necrosis.

Conclusions

- **Cryoablation** is an effective **minimally invasive** procedure to treat **fibromatosis.**
- **Clinical studies** have reported **tumor volume** reductions of up to 81% at 12-month follow-up and high rates of **symptoms improvement** (90%).[13]
- Further research is needed on the effectiveness of cryoablation in treating fibromatosis patients with several **risk factors** for recurrence.

References