Osteoid Osteoma: Imaging

- Traditionally, the X-ray showing a well-defined osteoid osteoma is a circle surrounded by a thin radiolucent halo that makes up the “cold spot.”
- The lesion typically appears on MRIs as an oval area of increased signal intensity.
- On CT scans, a “cold spot” is not present due to the lesion's high density.

Osteoid Osteoma: Therapy

- Osteoid osteoma ablation therapy consists of inflicting a lesion with a single, heated wire electrode tip.
- The goal is to ablate the bone tumor, causing the symptoms to disappear.
- Treatment is typically performed under a local or regional anesthetic.

Treatment with RFA

- RFA is a promising ablation technique, as it can target tumors up to 1 cm in diameter.
- The success rate for RFA is reported to be between 95% and 100%.
- The procedure is typically performed under CT guidance.

RFA of MSK Metastases: Indications and Contraindications

- The primary indications for RFA of skeletal metastases include:
  - Symptomatic lesions
  - Inoperable primary tumors
  - Lesions that are located in regions contraindicated for surgery

RFA of MSK Metastases: Technique

- The RFA probe is inserted percutaneously under CT guidance.
- The lesion is ablated by delivering radiofrequency energy to the tumor.
- The procedure is typically performed under general anesthesia.

RFA of MSK Metastases: Results

- Success rates of RFA for skeletal metastases range from 90% to 100%.
- Pain relief is typically achieved within 24 hours.
- The procedure is associated with minimal complications.

Future Directions for Percutaneous Ablation of Metastases

- Improved accuracy and targetability of RFA may lead to better outcomes.
- The use of imaging guidance to improve target localization.
- The development of new ablation techniques.

Selected References


Introduction

Radiofrequency ablation (RFA) is a percutaneous technique used to destroy abnormal tissue. It is in use for ablation of abnormal tissue in the musculoskeletal system. Since the early 1990s, RFA has become an increasingly popular method of destroying tumors. In the musculoskeletal (MSK) system, RFA has become the preferred method of treatments for osteoid osteomas in many centers and is used as an alternative treatment for other metastatic lesions, especially in peripheral areas.

RFA Physics

- RFA technology offers the ability to place a probe within the target and deliver currents to the lesion. The resulting heat radiation leads to the coagulation of the lesion.
- The probe is made of a metal sheath with a dielectric material at the tip, which allows it to be insulated while conducting heat to the lesion.

RFA Technology

- The original RFA probe is a 25-gauge needle that becomes delicate when applied to larger tumors.
- The current density decreases with the fourth power of the distance from the probe tip, making single lesions difficult to ablate.
- Multiple lesions can be targeted using a series of probes.

Complications of RFA

- Infection: Local infection rates range from 1% to 4%.
- Nerve injury: This is rare but can occur if the probe is placed too close to a nerve.
- Arising from nerve in skin (Fig 2).
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Osteoid Osteoma: Clinical

- The majority of cases in teenagers and young adults
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Osteoid Osteoma: Imaging

- An osteoid osteoma manifests on imaging as a well-defined osteoid osteoma.
- The lesion typically appears on MRIs as an oval area of increased signal intensity.
- On CT scans, a “cold spot” is not present due to the lesion's high density.

Osteoid Osteoma: Therapy

- The protocol for radiofrequency ablation of osteoid osteoma is fairly standard among most authors.
- The procedure typically consists of placing the probe through a small skin incision, followed by ablation of the lesion.
- The procedure is typically performed under a local or regional anesthetic.

Treatment with RFA

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