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## [Case Study: Rapid Tumor Necrosis After Intratumoral Chlorine Dioxide Injection]

**Patient:** Female, diagnosed with advanced ulcerative breast cancer

**Treatment:** Single ultrasound-guided intratumoral injection of chlorine dioxide

**Assessment timepoint:** 7 days after first injection

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### Before Injection (Day 0)






- **Tumor status:** Exophytic, ulcerated breast mass with active bleeding, purulent exudate, and high vascularization
  - **Color:** Bright red and dark purplish areas, consistent with active tumor growth and inflammation
  - **Texture:** Glossy, swollen, fragile surface
  - **Surrounding tissue:** Stretched, inflamed skin with signs of local pressure and pain
  - **Clinical impression:** Highly metabolically active and infiltrative lesion
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### After Injection (Day 7)

- **Tumor status:** Central necrosis with dry, collapsing tumor tissue
- **Color:** Yellowish-white and brown-black regions indicating deep tissue death and loss of viability
- **Texture:** Dry, irregular, shrinking tumor mass; signs of natural separation from surrounding skin
- **Exudate:** Greatly reduced secretion, minimal bleeding
- **Surrounding tissue:** Decreased inflammation and tension

- **Pain:** Significantly improved in most reported cases with similar response
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## Interpretation of Clinical Response

Parameter		Response Indication
Central necrosis		Effective tumor core devitalization
Loss of tumor turgor		Structural collapse due to cell death
Color change		Shift from vascular to necrotic appearance
Pain improvement		Likely due to decompression of nerve tissues
Infection control		No signs of acute secondary infection

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## Clinical Note:

This is a **typical example of rapid, deep necrosis** in response to intratumoral chlorine dioxide therapy. Such outcomes are commonly observed within the **first 5–10 days post-injection**. Further injections are often used to completely eliminate the residual tumor tissue.

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