Well done or medium rare: how do you order your tumor?

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In recent years, thermal ablation treatments for cancerous tumors have become more and more popular. Minimally invasive, with a much shorter healing time and reduced chances for infections and other surgery related side effects have made this emerging technique a favorable option for many kind of treatments.

With today’s ablation techniques it is possible to heat and destroy the tumors locally, without damaging adjacent healthy tissues. This is done by Radio Frequency ablation needles, Microwave applicators, lasers or High Intensity Focused Ultrasound (HIFU).

But doctors performing minimal invasive procedure, still needs to get some kind of feedback. How else would they know if the tumor is still “medium rare” (hence alive and risky) or if they have waited too much and it is already “well done” (hence, damaging too much healthy tissue around it)?

This is still the main technological challenge for those kind of treatments. Non-invasive imaging modalities might provide the remedy.

In this presentation our work on thermal monitoring of ablation treatments using X-Ray CT will be discussed. Approaches for estimating tissue damage non-invasively based on Hounsfield Units time and temperature related changes will be presented. Preliminary findings with tissue response using strain analysis will be introduced. And potential research continuation directions will be debated.