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# CT-guided cryoablation of renal masses

FROM THE SPECIALTIES

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## CT-guided cryoablation is offered at Akershus University Hospital to patients with benign and malignant renal masses.

Patients with small renal masses (≤ 4 cm) have traditionally been treated with nephrectomy or nephron-sparing surgery in the form of partial nephrectomy. Norwegian and international clinical guidelines now include thermal ablation as a treatment option for renal cancer (1, 2). Furthermore, Norway's clinical guidelines for cancer surgery recommend that health trusts performing surgery for renal cancer establish ablation treatment (3).

Thermal ablation involves using heat (radiofrequency ablation or microwave ablation) or extreme cold (cryoablation) to destroy tumour cells, with one or more thin needles being inserted into a renal mass. In cryoablation, argon gas circulates in the needles, creating temperatures as low as –180°C and forming an 'ice ball' that encapsulates the tumour along with a surrounding margin of 0.5–1 cm.

Over the past two decades, various methods of cryoablation have been used, including open surgical access, as well as laparoscopic and percutaneous image-guided approaches. Longitudinal data from retrospective cohort studies has documented the advantages of CT-guided ablation. These include limiting local tumour progression, improving cancer-specific survival, reducing complication rates, enhancing renal function preservation, shortening the recovery period and cost-effectiveness (4, 5).

In general, thermal ablation is particularly attractive for patients who are deemed unable to tolerate surgery or who require less invasive treatment. Ablation should also be considered for patients where preservation of renal function is crucial, such as those with existing chronic kidney disease, a single kidney, metachronous tumours, or hereditary kidney cancer.

Compared to thermal ablation treatments, cryoablation allows for precise monitoring of the ablation zone (the ice ball) using CT imaging and is safer for treating tumours larger than 3 cm located near the renal hilum (6).

Since 2023, Akershus University Hospital has offered CT-guided cryoablation for renal masses to selected patients. The urology, anaesthesiology and radiology departments have developed this treatment provision based on the model used at Aarhus University Hospital in Denmark, where over 200 kidney tumour ablations are performed annually.

One of the challenges in establishing CT-guided cryoablation is achieving a sufficient patient volume. Studies evaluating the learning curve for tumour ablation suggest that performing at least 25 ablations per year is necessary to maintain and further develop expertise (7). Since transitioning from the project to the operational phase after one year, we have treated 27 patients with a total of 30 renal masses. Patients are typically discharged the day after the procedure, but this could eventually become a day surgery procedure. Our initial results have been satisfactory and align with findings in the international research literature (4).

The method has been well received internally within our hospital trust. We believe this method has the potential to benefit even more patients, including those outside our catchment area who are candidates for and seek minimally invasive treatment.

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