

Title CRYOABLATION FOR CANCER TREATMENT

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Reference Technology Review Report - 019/2015, online:
http://www.moh.gov.my/index.php/database_stores/store_view_page/30/280

Aim

To review the available evidence on the effectiveness, safety and cost-effectiveness of cryoablation in the treatment of cancer patients.

Conclusions and results

Renal cell cancer

Laparoscopic cryoablation appeared better in perioperative outcomes in the treatment of small renal tumours (less than 4.0 cm who are not a surgical candidate) than laparoscopic partial nephrectomy though less effective in tumour control. However, it was safer with fewer complications. Cryoablation was as effective as other ablative therapies; radiofrequency ablation and microwave ablation in survival benefit and tumour control in the treatment of small renal tumours.

Hepatocellular cancer (HCC)

Percutaneous cryoablation was as effective as radiofrequency ablation in survival benefit (overall survival and tumour free survival). Percutaneous cryoablation appeared better in tumour control for selected HCC patients (tumour less than 4.0 cm in size). Cryoablation also appeared to be effective with survival benefit and low recurrence benefit in patients with solitary or multiple unilobar or bilobar liver metastasis from various primary sites treated with cryoablation compared with conventional surgery. Percutaneous cryoablation was relatively safe as radiofrequency ablation with no procedure related mortality. However major complications and death due to liver failure have been reported.

Lung cancer

Percutaneous cryoablation was comparable to sublobar resection and radiofrequency ablation in survival benefit in patients with stage I non-squamous cell lung cancer (NSCLC) unfit or medically unfit for surgery. Cryoablation was also effective when combined with molecular target therapy in 1-year survival rate and progression free survival compared with molecular target therapy alone in patients with advanced NSCLC. No procedure related mortality reported.

Prostate cancer

Cryoablation was less effective than either external beam radiotherapy or Radical Prostatectomy in terms of 1-year disease-free survival in patients with localised prostate cancer. Cryoablation however appeared safe with fewer

adverse events and procedural complications, namely urinary incontinence and urethral stricture with no procedure related mortality.

Breast cancer

Percutaneous cryoablation was feasible as minimally invasive adjunct therapy, with no short term recurrence and procedural success (coverage of tumour margin by 1cm of visible ice) reported in patients with in-situ breast cancer who refused surgery and patients with small breast cancers (diameters of 15 mm or smaller).

Bone metastasis

Cryoablation appeared effective in short term pain reduction in patients with painful metastatic bone lesions as palliative treatment that are refractory to standard therapies with no procedural complication.

Pancreatic cancer (pancreatic ductal adenocarcinoma)

Cryoablation was feasible in terms of pain control and provide survival benefit with low complication as ablative therapies for patients with unresectable locally advanced pancreatic ductal adenocarcinoma.

Recommendations (if any)

It is recommended for routine or selective use only.

Methods

Electronic databases were searched, which included PubMed, Medline, Journal @ Ovid full text via OVID, OVID EBM Reviews - Cochrane central register of controlled trials, EBM Reviews - Cochrane database of systematic review, Horizon scanning databases - Centre, Birmingham, Australia and New Zealand Horizon scanning (ANZHSN), FDA website, MHRA website and from non-scientific database - Google search engine. In addition, a cross-referencing of the articles retrieved was also carried out accordingly to the topic. Relevant articles were critically appraised and evidence graded using US/Canadian Preventive Services Task Force.

Further research/reviews required

More research is needed to ascertain the cost-effectiveness on this technology.

Written by

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