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ABSTRACTS – INVITED PAPERS

Pulmonary Metastases – the role of Radiofrequency Ablation

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Radiofrequency ablation (RFA) is a minimally invasive, image guided procedure whereby needle electrodes are inserted into a tumour and an alternating current delivered. The current causes ionic agitation and frictional heating in a localised area around the needle tip resulting in cell death. The geometry of the ablation depends upon the shape of the electrode, power input and the length of time the current is applied. CT scans are used to guide electrode placement and monitor the effect of treatment. RFA has been successfully applied to small, < 3.5cm tumours, either primary or secondary. Most treatments are performed under conscious sedation but general anaesthesia is useful for larger tumours, multiple tumours or ablations adjacent to the diaphragm. Most parts of the lung can be successfully accessed but peripheral tumours are easier to target. The complication profile is well understood with pneumothorax occurring in approximately 40%; a not dissimilar incidence to that seen with percutaneous lung biopsy. Analysis of the factors associated with pneumothorax showed an increased rate in patients who have multiple tumours treated and with the length of aerated lung that is traversed by the electrode. Tube insertion is required in approximately 10%, depending on the size and speed of development of the pneumothorax and baseline lung function. Other rarer complications include pleural effusion, haemorrhage and infection. On CT scans the ablation zone is initially seen as subtle ground glass opacification. Over the next few months the ablation zone becomes progressively denser and more homogeneous and then reduces in size. In some cases little more than a linear scar remains at 12 months. Recurrence is identified by enlargement of the ablation zone after 3 months, a change in the shape of the ablation zone indicating focal enlargement in one area, and by the development of nodular enhancement. Recurrence is more common in larger tumours > 3 - 3.5 cm, tumours that are in direct contact with blood vessels > 3 mm in diameter, and tumours in contact with larger bronchi. Currently RFA is offered to patients with small volume but inoperable metastases.

Conclusion: RFA has been shown to be both safe and effective for the destruction of small tumours. The role of RFA relative to other modalities has yet to be established.