

# Intrapleural catheters: changing the paradigm of malignant pleural effusion management

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Malignant pleural effusions (MPEs) are commonly encountered across many secondary care settings and have been estimated to occur in up to 15% of all patients with cancer.<sup>1,2</sup> They can be associated with significant personal disruption plus financial burden to both the individual and healthcare services, primarily due to necessity, and length, of inpatient stay. In a recently published study evaluating over 100,000 patients with a MPE, more than 25% were readmitted to hospital within 1 month of discharge, and of these, 17% died during the readmission.<sup>3</sup>

As fluid accumulates between the visceral and parietal pleura, individuals can experience progressive breathlessness and impaired exercise tolerance due to compression of lung parenchyma, and suboptimal chest wall and diaphragmatic movement. MPEs usually herald advanced cancer with a median survival of 3–12 months depending on primary site and other prognostic factors.<sup>1,2,4,5</sup> Management of a MPE has multifaceted objectives and includes relieving symptoms, improving quality of life, preventing repeated pleural procedures, avoiding hospital admissions and minimising length of stay.

The traditional management of a suspected (or known) MPE typically involves insertion of an intercostal chest drain of no standard bore size, often inserted by inexperienced medical staff; once fluid has ceased draining, pleurodesis – typically with a talc slurry instilled in a ward environment – is performed. Unfortunately the success rate of pleurodesis with different agents is variable and there is no reliable way by which to predict success.<sup>1,2</sup> Moreover, in the presence of a trapped lung – where lung is unable to fully expand owing to formation of a fibrous visceral pleural rind – attempted pleurodesis often fails and is generally not indicated.<sup>1,2</sup>

A major step forward in the armamentarium of clinicians managing MPEs are indwelling pleural catheters (IPCs; Figure 1).<sup>6</sup> These are small silicon tubes that are inserted under ultrasound guidance and tunnelled subcutaneously to end within the pleural cavity; a one-way valve is located at the skin surface allowing individuals, carers, but most often trained healthcare professionals, to drain off excess pleural fluid on a regular (often thrice weekly initially) or as required basis. This enables patients to have a degree of self-control over symptoms, maintain independence and avoid hospital admissions. They are usually inserted as a day case procedure and only minimal (typically only local) analgesia is required. Crucially, having an IPC in situ does not preclude administration of chemotherapy.

Increasing amounts of data have emerged in the last two decades highlighting the benefits of IPCs.<sup>7–14</sup> For example, one systematic review that involved 1,370 patients across 19 studies explored putative benefits and complications associated with IPCs. Symptomatic improvement was found in approximately 96% of those treated with an IPC, no complications were reported in 88% and spontaneous pleurodesis occurred in just <50% overall.<sup>13</sup> In a recent study, it was observed that in those without a trapped lung, giving talc slurry through an IPC (10 days following insertion) was associated with a higher ( $p = 0.008$ ) chance of pleurodesis at 35 days vs IPC alone.<sup>14</sup> In one real-life retrospective study involving 68 patients, the median survival following IPC insertion was 141 days and of these, only three relatively minor complications occurred.<sup>6</sup>

As with most interventions in medicine, drawbacks and issues do of course occur, with the most common being pain, skin or pleural infection, loculations and blockage (although complete blockage is not common). In a large

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**Figure 1** An intrapleural catheter (IPC) in situ connected to an intermittent drainage bottle that is easily disconnected at home. In this patient, the IPC was inserted for treatment of a malignant pleural effusion and spontaneous pleurodesis was achieved after 8 weeks of intermittent drainage; it was subsequently removed without difficulty



multicentre retrospective review of 1,021 individuals, only 5% developed an IPC-related pleural infection of which 94% were successfully treated with antibiotics.<sup>15</sup> Although not an absolute contraindication, careful consideration is required prior to insertion of an IPC in those thought to have a life expectancy less than a few weeks. It is important to note that IPCs can be removed once fluid drainage ceases due to spontaneous pleurodesis or when complications, such as intractable pleural sepsis not controlled by antibiotics, occur. Patients and primary healthcare professionals need to have an easily accessible point of contact whereby advice can be

sought in a timely manner in the event of an IPC problem (or related question or uncertainty) arising.

In light of all the emerging data and increasing real world use of IPCs, when should they be considered? Guidelines published in 2010 by the British Thoracic Society suggest that individuals with an MPE should be considered for an IPC when talc pleurodesis has previously failed, or is unlikely to succeed owing to a trapped lung.<sup>2</sup> More up-to-date American Thoracic Society guidelines go one step further and suggests either IPC or talc pleurodesis as primary treatment in those with a lung likely to expand (i.e. non-trapped).<sup>16</sup> It is, therefore, important that clinicians and other healthcare professionals across a spectrum of specialties (including family doctors) are now aware of the existence of IPCs and of the critical role they now play in shifting the paradigm of MPE management. Evidence suggests they are safe and effective, and it is likely they will form an increasingly vital place in managing breathlessness and improving quality of life in those with advanced cancer. Moreover, data are also emerging demonstrating benefit in individuals with recalcitrant, symptomatic and difficult to control benign pleural effusions.<sup>17</sup> In the years ahead, it is likely that IPC use will expand exponentially across the globe and other specialists such as palliative care clinicians and oncologists may seek to acquire the skills to insert them. Perhaps in the future, as further data emerges, patients (without a trapped lung) undergoing IPC insertion will receive 'routine' sterile talc instillation within several weeks, with a view to consideration of subsequent removal if drainage ceases due to pleurodesis occurring. ①

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