

Indwelling Pleural Catheters

A Clinical Option in Trapped Lung



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KEYWORDS

• Indwelling pleural catheter • Lung cancer • Malignant pleural effusion • Palliative treatments

KEY POINTS

- Malignant pleural effusion (MPE) is a form of advanced cancer and is associated with short-term median survival.
- Ideal treatment of MPE should achieve effective long-term symptom relief, minimize hospitalization, and reduce adverse effects.
- Indwelling pleural catheter (IPC) is a useful option for the management of MPE.
- IPC offers advantages over pleurodesis in patients unfit for pleurodesis and controls symptoms in patients with trapped lung.
- IPC can be used in patients with poor performance status or with high surgical risk and short life expectancy.

INTRODUCTION

MPE is a complication of almost any site of primary cancer as well as primary tumors of the pleura. The most common presenting symptoms of MPE are dyspnea, cough, and chest pain. All these symptoms have a real impact on quality of life (QOL). On the other hand, from an oncological point of view, MPE always represents a form of advanced cancer and is associated with a short-term median survival that varies according to the primary tumor site.¹ The palliation of MPE can be performed with a surgical approach through VATS under general anesthesia. In patients unfit for general anesthesia, awake pleuroscopy represents an alternative for pleurodesis because it is usually performed under conscious sedation and

local anesthesia alone. Also, sclerosing agents can be administered at the bedside through a chest tube. To date, randomized trials have failed to show the superiority of VATS/pleuroscopy versus bedside chest tube approaches, when pleurodesis is the primary study endpoint. Nevertheless, many physicians assume thoracoscopic/pleuroscopic ways are superior based on their personal experience and secondary outcome analyses reported in the literature. Nowadays, talc is widely regarded as the best agent for pleurodesis. Many agents display a different form of efficacy as pleurodesis agents (Table 1).^{1,2} For VATS or pleuroscopic procedures, patients with MPE frequently require hospitalization. Nevertheless, for these patients, the real priority is to minimize the days spent at the hospital, thereby

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Table 1
The rate of success of chemical pleurodesis

Pleurodesis Agent	Pleurodesis (%)	Reference
Talc slurry (2–5 g)	90	36
Talc poudrage (2–5 g)	93.4	37
Tetracycline (1–1.5 g)	67	37
Others	>50	38

Data from Simoff MJ, Lally B, Slade MG, et al. Symptom management in patients with lung cancer: diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2013;143(5 Suppl):e455S–97S.

allowing them back home as soon as possible. The ideal treatment of MPE should include adequate and enduring relief from symptoms (in particular dyspnea), minimize hospitalization, and reduce adverse effects.³ The IPC is increasingly used for the management of MPE⁴ and is preferred for patients with a trapped lung or failed pleurodesis (Table 2).⁵

THERAPEUTIC OPTIONS

When Can Patients Be Proposed Indwelling Pleural Catheter Placement?

IPCs are typically inserted on an outpatient basis under local anesthesia followed by drainage at home performed by trained family members or dedicated home care providers.⁶ IPC aims to

intermittently drain the MPE to maintain an adequate lung expansion without a attempt at causing pleurodesis. With IPC alone, approximately half of patients eventually achieve pleurodesis. IPC is effective in controlling symptoms not only in MPE but also in patients with trapped lung (Table 3).⁷ Patients with poor performance status or high surgical risk should be considered for IPC placement because patients with longer survival should preferentially be offered pleurodesis rather than IPC.⁸ In patients with extremely low survival (days or few weeks), the optimal treatment consists of thoracentesis plus systemic administration of opioids.¹ IPC could be used in patients whose expected survival is longer with excellent outcomes. IPC could also be used during systemic chemotherapy.⁹ IPC could be placed in patients with underlying hematologic malignancy and significant immunosuppression because a similar overall infection rate to another procedure has been reported in previous studies.¹⁰ Not last, IPC seems a safe and effective treatment of MPE in advanced pediatric cancer, achieving the relief of symptoms and shortening hospitalization.¹¹

The World Market of Indwelling Pleural Catheters

The first report in the literature of a patient sent home with an IPC was in 1986 when a Tenckhoff catheter was placed with drainage at the patient's home twice a week. The Copernican revolution in MPE management was the approval of the PleurX catheter (Denver Biomedical, Golden, Colorado) in

Table 2
The options of treatment of malignant pleural effusion

Option of Treatment	Indication	Notes
Repetitive thoracentesis	Recurrent effusion in patients with poor performance status Short expected survival	High recurrence rate Complications: pneumothorax, empyema
Talc slurry	Symptomatic recurrent large effusion	Alternative to pleurodesis via pleuroscopy Not available in trapped lung
Talc poudrage	Symptomatic recurrent large effusion	Not available in trapped lung
Indwelling pleural catheter	Symptomatic recurrent effusion in patients with poor performance status Trapped lung Failed pleurodesis in patient with good health and long survival	Costs Catheter obstructions Catheter tract metastasis (?)

Data from Simoff MJ, Lally B, Slade MG, et al. Symptom management in patients with lung cancer: diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2013;143(5 Suppl):e455S–97S.

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