Malignant pleural effusions (MPEs) affect as many as 150,000 patients with cancer in the United States and 100,000 patients with lung cancer in Europe each year. Inpatient care alone for MPE costs ~US$6 million per million population in Australia annually (data, the Western Australia Health Dept). The exciting advent of indwelling tunneled pleural catheters (IPCs) has critically challenged conventional approaches to MPE management, especially pleurodesis. IPCs offer ambulatory fluid drainage as the primary symptomatic therapy, thus prompting clinicians to redefine the goalposts of MPE care.

Talc pleurodesis has been the mainstay of MPE management for decades, but its efficacy and safety have recently come under scrutiny. In the largest randomized trial in pleural disease ($n = 486$), talc (poudrage or slurry) pleurodesis had a suboptimal success rate: only ~75% of MPE patients at 1 month and ~50% by 6 months had adequate fluid control. Adding the fact that many patients are unsuitable for pleurodesis (e.g., with trapped lungs), talc pleurodesis benefits only a subset of all MPE patients. Randomized trials have also shown that talc induces lung and systemic inflammation and killed 2.3% of patients in a Cancer and Leukemia Group B study through talc-induced respiratory failure. Although this acute lung injury can be avoided by using large particle size talc preparations, such products are not readily available in many countries, including the United States.

These data have provoked debates and compelled the pleural community to revisit the principles of MPE care. The fundamental aim in MPE management is to improve dyspnea and quality of life, with minimal intervention and hospitalization. The timely introduction of IPCs which allow fluid evacuation from a single minimally invasive procedure serves exactly this purpose and explains its rapid rise in popularity (Suzuki et al estimated that 39,000 units sold in the United States per year).

Suzuki et al. in this issue of Journal of Thoracic Oncology reported the largest series of IPC ($n = 418$) experience, providing corroborative evidence that IPCs are safe. A recent summary of all published reports on IPC complications revealed that most complaints were minor (e.g., mild pain after insertion). A systematic review including 1370 patients has confirmed that serious complications, e.g., infection were uncommon (<3%). Other series have addressed specific concerns of IPC use: demonstrating safety records in patients undergoing chemotherapy and local radiotherapy with IPC in situ, and no significant protein loss results from regular drainage.

IPC represents a new therapeutic ideology (not “yet another catheter”), and clinicians are still adapting to the specific changes needed to realize the full potential of this device. Suzuki et al. described a representative single-center review of IPC use, highlighting important contemporary issues of IPC management.

First, the exact place of IPC in the paradigm of MPE management has yet to be defined. IPC is generally accepted for treatment of MPE patients in whom pleurodesis has failed or is contraindicated (especially trapped lungs). Many specialist centers now offer...
IPC as the first-choice therapy in place of talc pleurodesis, among growing recognition of its limitations. There are, however, no head-on comparisons between these two strategies. This issue is being addressed by a multicenter randomized trial in the United Kingdom (near completion) and one planned in the Netherlands that compare IPC versus talc pleurodesis as first-line therapy in MPE patients. Until the results are available, the debate will continue. Patients, in the meantime, should be allowed to make an informed choice of treatment that best meets individual needs. Clinicians have to have knowledge of the pros/cons of each therapy to guide patient decisions.

Second, aftercare of IPC is crucial to its effective and safe employment. A dedicated IPC service, already available in selected centers, is recommended. Clinicians prescribing IPC treatment must be committed to its ongoing care, akin to peritoneal (dialysis) catheter. As reported by Suzuki et al., IPCs are often inserted (even within one center) by different specialists: surgeons, radiologists, or pulmonologists, many of whom do not have infrastructure established to provide community support and close follow-ups. A centralized IPC service allows clinicians to gain expertise and avoid dilution of experience during the active learning phase. IPCs managed by a specialist pleural center have significantly fewer complications (Fysh et al., unpublished data). Growing numbers of specialist centers are developing dedicated pleural services (see review in Ref. 19) to provide efficient and safe pleural procedural services. These pleural units will be best placed to deliver IPC care.

Third, IPC signals the arrival of symptom-directed palliative therapy in MPE. “Success” must now be defined by patient-oriented parameters. The conventional measurement of “success” by pleurodesis rate, often measured by absence of fluid on radiographs, is of peripheral importance. Suzuki et al. defined success as no further effusion-related drainage procedure; it is a step toward the right direction, and their success rate of 91% with IPC was encouraging. The priority for most MPE patients are alleviation of dyspnea and optimization of quality of life (the principle end points for aforementioned European multicenter trials) while avoiding hospital admissions (end point of the Western Australian State Health Research Advisory Council pilot study). These parameters should be considered new goals for IPC care and research.

The full potential and impact of IPCs on the paradigm of pleural effusion management are only beginning to be realized. Past studies have suggested that ambulatory sclerotherapy can be performed by small bore catheters when the initial effusion has been drained. IPCs can also be used after thoracoscopy to speed up discharge. The indication for IPC has been extended to other recurrent effusions, including hepatic hydrothorax, chronic empyema, and chylothorax. In the long run, IPCs may be used as a one-stop procedure for patients presenting with a suspected MPE, providing both diagnostic and therapeutic drainage as well as definitive MPE management, if cytology confirms malignancy.

Pleurodesis, from the scientific standpoint, is an unsophisticated crude act. Mechanical or chemical pleurodesis work by damaging the pleura, which heals with inflammation, scarring, and pleural symphysis. The more severe the pleural injury is, the greater the likelihood of achieving pleurodesis. Over three quarters of a century after the description of talc poudrage, IPC provides a viable alternative that avoids mutilation of the pleura. Nevertheless, the ultimate goal in MPE management remains to stop the fluid formation, which can negate the need for either IPC or pleurodesis. Antiangiogenics have shown great promise in preclinical models, but clinical proofs are lacking. In this era of individualized targeted cancer therapy, management of MPE remains relatively primitive and should be regarded a high priority in cancer research.

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**REFERENCES**


