CHEST

Talc Pleurodesis Through Indwelling Pleural Catheters for Malignant Pleural Effusions

Retrospective Case Series of a Novel Clinical Pathway

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Malignant pleural effusions cause significant morbidity, but there is no gold standard minimally invasive treatment. A new therapeutic approach combines talc pleurodesis and indwelling pleural catheters (IPCs) to enable outpatient management. This case series summarizes the safety and efficacy data of all patients (24) with a symptomatic malignant pleural effusion who underwent talc pleurodeses via IPCs between December 2010 and July 2013. Successful pleurodesis was achieved in 22 procedures (92%). There was one empyema, one hydropneumothorax, one recurrent effusion, and two minor complications: one drain site wound infection and one complaint of chest pain. Twenty-two procedures (92%) were performed in the outpatient setting. This report confirms the safety and efficacy of administering talc slurry through IPCs in an outpatient setting. Studies in a larger cohort are necessary to define the role of this novel approach in the treatment algorithm of patients with this condition.

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ABBREVIATIONS: IPC = indwelling pleural catheter; VATS = video-assisted thoracoscopic surgery

Malignant pleural effusions affect > 150,000 patients in the United States each year, reflecting advanced disease.[1] In the United Kingdom, the estimated incidence is one new case per 1,000 population per year.[2] Mean survival ranges from 3 to 12 months after diagnosis[3]; the primary aim is palliation.

Talc poudrage via video-assisted thoracoscopic surgery (VATS) is generally the preferred treatment.[4,5] However, VATS is not widely available, so talc slurry via chest tube is a popular alternative. There is no evidence favoring talc administration via chest tube or VATS; two randomized controlled trials showed comparable outcomes.[3,6,7]

As an alternative to talc pleurodesis, indwelling pleural catheters (IPCs) have been used.[8] IPCs allow long-term drainage of effusions over periods of weeks to months, useful especially in cases of trapped lung, where talc pleurodesis is likely to fail. IPCs can be inserted as day case procedures, unlike chest drains, which usually require hospital admission.

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A new therapeutic approach involves delivering talc pleurodesis through an IPC. This exploits the strengths of IPCs and the main benefit of talc pleurodesis, which is preventing recurrence. This novel approach also allows outpatient management.

This case series describes the initial experience of our center. To our knowledge, there are no published data on this approach. There is only one pilot study of doxycycline, now superseded by graded talc, being given through an IPC.[9]

Materials and Methods

Study Design

A new treatment protocol was initiated in 2010. To assess outcomes, we performed a retrospective review of procedure documentation, radiology data, and clinic letters. We collected data on the safety, complication rates, and success of talc pleurodesis through an IPC.

Participants

Details of all talc pleurodeses via IPCs between December 2010 and July 2013 were reviewed. We included all procedures on patients with a symptomatic malignant pleural effusion performed by the respiratory department at St. Thomas' Hospital. Histologic confirmation of the primary tumor was obtained in all cases. Patients were excluded from the study if their primary tumor was small cell lung cancer or lymphoma or if their World Health Organization performance status was >1.

Interventions

All procedures were performed on an outpatient basis, unless the patient had already been admitted to hospital. Figure 1 outlines the management protocol. Patients were initially assessed for trapped lung with the help of chest radiographs and CT scans (where available), as well as with pleural manometry. An IPC (PleurX) was inserted using a standard technique.[10] After the IPC insertion, pleural fluid was drained maximally, guided by pleural manometry and monitoring for chest pain. Patients were then sent home with instructions to drain the IPC daily for 3 days with 1-L vacuum bottles. When patients were unable to perform drainage themselves, district nurse visits were arranged. The volumes of fluid drained were recorded.

Patients were reviewed 3 days later by a specialist pleural nurse. They were assessed for lung reexpansion and resolution of effusion with thoracic ultrasound. Six areas of the hemithorax were assessed (Fig 2). When at least five areas had good pleural approximation to the chest wall, this was defined as $>90\%$ of lung reexpansion. In the case of uncertainty, chest radiographs or CT scans were used. If the lung had not reexpanded, continued regular drainage (depending on fluid output) was advised. If the lung was fully reexpanded in five or more areas on ultrasound, and the drainage was <200 mL/d, talc slurry was delivered through the IPC. Twenty to 25 mL 1% lignocaine was given through the IPC, along with 2.5 to 5 mg oral morphine, followed by 4 g graded talc dissolved in 50 mL normal saline, and flushed with 50 mL normal saline afterward. Patients were observed for at least 1 h following talc instillation.

They were then sent home with instructions to drain the IPC daily for 3 days with 1-L vacuum drainage bottles. District nurses assisted patients when required. Three days later, pleural symphysis was assessed with thoracic ultrasound. Pleurodesis is demonstrated by the absence of a pleural sliding sign (sliding of the visceral pleura over the parietal pleura during respiration). If there was good pleural approximation and loss of pleural sliding in $>90\%$ of the hemithorax, patients were advised to stop drainage for 2 weeks. If there was no further fluid reaccumulation, the IPC was removed.

Assessments

Complications and hospital admissions were documented on the electronic patient record system. Pleurodesis was assessed 3 days after talc instillation. Pleurodesis success was determined for most patients at 14 days after talc instillation at the point of considering IPC removal.

Results

During the study period, 57 IPCs were inserted for patients with malignant pleural effusions. Thirty-three procedures were excluded from the study because there was no subsequent talc pleurodesis through the IPC (reasons included trapped lung and performance status >1). The remaining 24 procedures fulfilling the study criteria were analyzed.

The baseline patient characteristics are summarized in Table 1. The median age was 70 y (range, 36-83 y), and there was a predominance of women (58%). The primary tumor was non-small cell lung cancer in 54% and breast cancer in 21%; the remaining 25% was composed of ovarian cancer, rectal cancer, renal cell cancer, tongue cancer, and thymic cancer. Eighteen effusions (75%) were right sided.

The postpleurodesis outcomes are summarized in Table 2. Successful pleurodesis was achieved in 22 procedures (92%).

Details of complications are summarized in Table 3. The overall complication rate was 21% (five complications). The major complications (making up 13%) were one hydropneumothorax, one empyema, and one recurrent effusion. The minor complications (making up 8%) were one drain site wound infection and one patient with chest pain.

One complication was not included in this analysis because it was not attributable to the procedure being investigated: talc slurry through an IPC. The patient developed a pneumothorax after insertion of the IPC, before talc pleurodesis.

Discussion

This case series of 24 procedures shows that talc pleurodesis via IPC is effective, with successful pleurodesis in 92% of procedures. The procedure is also safe, with a major complication rate of only 12%. Reactions to graded talc were not seen in these patients.