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Original Research Article

Video Assisted Thoracoscopy Talc Pleurodesis in the Management of Metastatic Pleural Effusion

Ghebouli K[1*], Bendjoudi K[2], Larkem H[3], Kecir MA[3], Belbekri M[3]

[1]Department of Cardiovascular Thoracic Surgery and Organ Transplantation CHU Mustapha Algiers, Algeria
[2]Department of anesthesia CHU Mustapha Algiers, Algeria
[3]Department of thoracic surgery CHU Constantine, Algeria

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Abstract: ***Introduction*:** Metastatic pleural effusion complicates many cancers and impairs patients' quality of life. In a palliative situation, the decision between thoracoscopy talc pleurodesis, tube chest, iterative punctures or abstention is difficult and often operator dependent. ***Materials and methods*:** We report a study of 87 patients with metastatic pleural effusion treated by video assisted thoracoscopy talc pleurodesis. ***Results*:** Breast cancer constitutes the primary site causing metastatic pleural effusion in approximately half of cases, followed by bronchopulmonary cancers and finally digestive cancers. The complete response rate in the short and medium term is very satisfactory. We did not report any complications apart from one case of empyema. ***Conclusion*:** video assisted thoracoscopy talc pleurodesis constitutes an interesting treatment for recurrence of metastatic pleural effusion.

Keywords: Metastatic pleural effusion, talc pleurodesis, videoassisted thoracoscopy.

INTRODUCTION

Metastatic pleural effusion is defined by the presence of tumor cells in the pleural fluid secondary to the implantation of cancerous nodules on the serous surface of the pleura leading to excessive production of serous fluid. This is a common clinical situation; one in two patients with metastatic cancer will see their progression complicated by pleural effusion [1].

Malignant pleural effusions constitute a diagnostic and therapeutic problem due to their chronic and rapidly recurrent nature, thus affecting the quality of life of patients through the frequent reconstitution of pleural fluid requiring iterative punctures.

Therapeutically, although chemotherapy or hormonal therapy makes it possible in certain cases to obtain at least temporary resolution of the effusion during Hodgkin's diseases, lymphomas, breast cancers, small cell cancers in particular, this effusion will recur sooner or later [2]. In these cases, pleurodesis constitutes a method of choice.

Video assisted horacoscopy, a real window on the pleura, allows not only a reliable diagnosis but above all to dry up this effusion by instilling a chemical agent “talc”. The use of talc to obtain a pleural symphysis was described by Norman Bethune in 1935. The idea was the creation of inflammatory adhesions between the parietal layer and the visceral layer makes the pleural cavity disappear, and thus prevents the accumulation of liquid in this space.

The prerequisites for talc treatment are a sufficiently preserved general condition (PS ≪ 2), survival greater than three months, possible lung re expansion and a potential clinical benefit after evacuation of the fluid (trapped lung, condition of the underlying lung?). The absence of significant pleural effusion without mediastinal shift (endobronchial tumor?). The aim of this study is to evaluate the short and long term effectiveness of video assisted thoracoscopy talc pleurodesis talc age in the management of metastatic pleural effusion.

PATIENTS AND METHODS

This is a retrospective descriptive and analytical study including 87 patients who benefited, between January 1, 2018 and December 31, 2022, from video assisted thoracoscopy talc pleurodesis for recurrent metastatic pleural effusion. All patients underwent a complete clinical examination, chest X-ray and chest CT scan before admission.

All patients were operated on under general anesthesia with selective intubation. The patient is

***Corresponding Author:** Khalil Ghebouli
Department of Cardiovascular Thoracic Surgery and Organ Transplantation CHU Mustapha Algiers, Algeria

positioned in lateral decubitus on the healthy side, with the lateral ipsi arm above the head making the intercostal spaces a little wider and thus facilitating the introduction of the trocars.

A first 10mm trocar is inserted at the mid-axillary line, generally at the 7th intercostal space. Once the trocar is inserted, a tube mounted on a syringe is inserted allowing systematic samples to be taken for cytobacteriological and biochemical study even if this has been done before (Fig1).

Fig. 1: Pleural sample for study

Subsequently, a suction cannula is introduced through the same trocar to gently suck up the pleural fluid. Once the liquid has been aspirated, a camera is introduced allowing exploration of the entire pleural cavity. Two other 5mm trocars are introduced in triangulation.

Sometimes exploration can be hampered by the presence of secondary adhesions, especially phenomena induced by punctures. In this case, release of the lung is necessary to ensure good lung re-expansion at the end of the procedure and allow a homogeneous symphysis. Multiple, staged biopsies are taken using biopsy forceps (Fig 2) and then sterile talc is pulverized (Fig3).

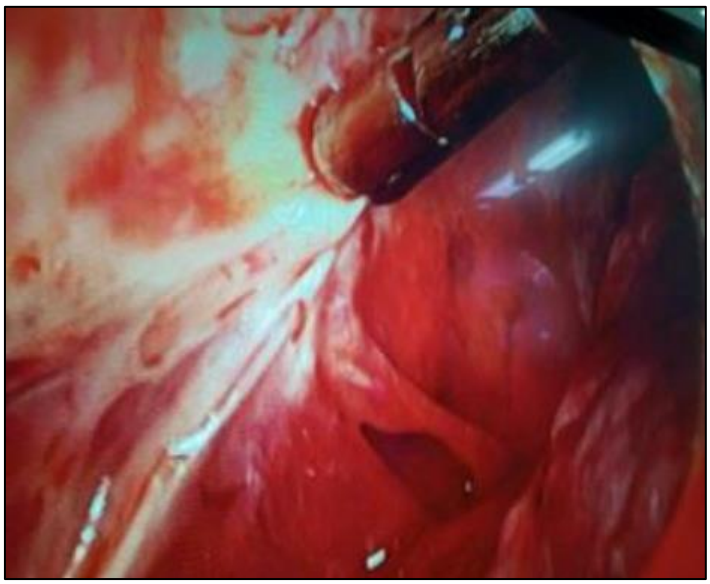

Fig. 2: Pleural biopsy

Fig. 3: Talc spray

A chest drain is inserted into one of the ports at the end of the procedure.

We studied the clinical data of the patients (age, sex, history, and etiologies), the imaging data, and finally the data of the intervention and its results.

The average duration of patient follow-up was one year. The results of pleurodesis were defined as follows [3]:

- The response was said to be complete when there was no fluid recurrence throughout the patient's lifespan.
- The partial response corresponded to the persistence of a little fluid in the pleural cavity (less than 50% of the initial quantity). Not requiring subsequent puncture for the entire life of the patient.
- Failure is defined by the radiographic persistence of a pleural effusion associated or not with clinical symptoms requiring an evacuative pleural puncture.

RESULTS

During the period of our study, 87 cases of metastatic pleural effusion underwent video assisted thoracoscopy talc pleurodesis. The study involved 28 men and 59 women with a sex ratio of 1/2. The average age of our patients was 57 years with extremes ranging from 33 to 79 years.

The average duration of symptom progression before admission was 98 days ± 10 days with extremes ranging from 9 days to 190 days. The clinical signs were: dyspnea (68.97%), chest pain (42.53%), cough (36.87%) and hemoptysis (2.30%).

The Performans status (PS) of the patients was rated 1 in 82.76% and 2 in 17.24%. Pleurisy was right in 57.47%, left in 34.48% and bilateral in 8.05%.

Half of the patients had a known neoplasia with secondary pleural localizations, the rest of the study population underwent video assisted thoracoscopy for diagnostic and therapeutic purposes (talc pleurodesis) at the same time. Primary cancers are dominated by breast cancer in 47.13%, followed by bronchopulmonary cancers in 28.74%, digestive cancers in 18.39%, gynecological cancers in 3.45% and finally bone cancers in 2.30%. The appearance of the pleural fluid was hemorrhagic in 57.74%, clear in 27.59% and serohematic in 14.94% of cases.

Before talc treatment, repeated pleural punctures were performed in all patients. The frequency of punctures was once a week in 31.03%, twice a week in 49.43% and more than twice a week in 19.54%. The average duration of drainage was 3 days (with extremes of 2 and 5 days).

The results of pleurodesis were marked at 1 month by a complete response in 95.40%. At 3 months the response was complete in 88.51%, partial in 10.34%. A failure was noted in only one case (1.15%). Complications encountered were chest pain in 17.24%, fever in 9.20%, and pleural fluid infection in 1.15%. Intraoperative mortality was nil and 3.49% at 3 months.

DISCUSSION

Our study made it possible to collect 87 patients whose average age is 57 years, consistent with that reported by the study carried out at the pulmonology department of Sétif University Hospital, Algeria (56 years) [4], by Kalai. R *et al*., (56 years old) [5]. It is and inferior to that of Barazzutti. H *et al*., (67 years old) [6].

Concerning gender, in our study we noted a clear female predominance (67.82% women 32.18% men), which is consistent with the results of a French study from Ny [7], which also found a female predominance (52.7% women 47.3% men). Conversely, Kolshmann [8], Chen [9], Moumeni [4], all found a male predominance.

This female predominance can be explained in our series by the predominance of breast tumors. Indeed, this high frequency of breast cancer in our study is reported by other authors [10, 11], and is explained not only by the high frequency of breast cancer in women [10, 11], but also by the ease of pleural involvement by contiguity. In other studies, Bielsa *et al*., [12], bronchopulmonary cancers are the most dominant (41%), in ours these cancers come second with a rate of 28.74%.

The average duration of symptom progression before admission was 98 days ± 10 days with extremes ranging from 9 days to 190 days. It is shorter than that reported by Moumeni (2 months) [4]. This could be explained by the vocation of our service which is dedicated to thoracic surgery, the recruitment of our patients is done through the pulmonology and oncology services which take a little time to refer their patients after investigation and/or therapeutic failure.

The most common symptom is dyspnea which occurs in 68.97% of cases. It is progressive in relation to the abundance of fluid but can be linked to the obstruction of a large bronchus or associated carcinomatous lymphangitis. Our figure appears lower than in the studies reported by Kolschman (86.3%) [8], and Thi bich (90%) [13]. This could be explained by the rigorous selection criteria of our patients whose general and respiratory condition allows general anesthesia. The other clinical signs include chest pain (42.53%) and cough (36.87%).

The location of pleural effusion in our study was on the right for 57.47% of cases, which is similar to the results of Thi Bich [13], in whom 56.3% of pleural effusion was on the right. Electively right drainage of the subdiaphragmatic lymphatic plexuses would explain this predominance of right effusions [14].

The usual course of neoplastic pleural effusion is marked by more or less rapid reconstitution as illustrated by the frequency of punctures in our study where 68.97% of patients underwent at least two punctures per week. These punctures associated with the lack of pulmonary re-expansion are the cause of pleural adhesions which must be released before spraying the talc.

In our study the average duration of drainage was 03 days, which is comparable to that found by Garrouch (04 days) [15], and shorter than that found by Kolschmann (06 days) [8], Barbetakis (06 days) [16], and Viallat (5.3 days) [2].

The immediate response rate in our series is 95.40%. These results are similar to those of the largest published series. Boniface and Guérin in France [17], on 270 patients found a response rate of 93%, Sanchez-Armengol and Rodrigez-Panadero [18], (119 patients, 87% responses) in Spain, Canto *et al*., [19], (128 patients, 86% responses). Our rate appears higher than Ladjimi *et al*., [20], in Algeria.

At three months this rate dropped to 88.51%, this could be explained by the progression of the primary cancer. We noted only one case of failure, it was lung cancer with significant pleural extension, in fact the existence of large buds hinders the contact of the parietal and visceral pleural layers which are prerequisite for the symphysis.

Complications are rare and most can be prevented. The potential carcinogenic risk of introducing talc into the pleural cavity is zero, provided that talc is not contaminated with asbestos: no case of induced pleural cancer has in fact been reported in the literature [21].

We did not note any pain linked to the spraying of talc given that the procedure was performed under general anesthesia allowing better comfort for the patient and the surgeon, however pain in the first 24 hours was observed in 17.24% of cases managed by multimodal analgesia.

Fever was observed in 9.20% of cases. This is not always synonymous with infection; it often occurs in the first days following talc powder and is linked to an inflammatory reaction to talc powder.

Infection of the pleural cavity was observed in a single patient one month after talc pleurodesis with a partial response, which was treated by the establishment of a washing irrigation system and prolonged antibiotic therapy. Note that this patient was punctured eight times before the talc procedure and we believe that this is a nosocomial infection introduced by the puncture.

The prognosis of cancers at the stage of metastatic pleural effusion after talc pleurodesis is relatively good in our series probably linked to rapid treatment, and the rigorous selection of our patients who must meet the main criteria: the absence of a lung “trapped” and a theoretical survival estimated at more than 3 months in a patient in good general condition PS≤2. Intraoperative mortality was zero and the lethality at 3 months was around 3.49% linked to the progression of the cancerous disease.

CONCLUSION

Persistent and recurrent metastatic pleural effusion has a deleterious effect on the health and general condition of the patient through the dyspnea and chest pain it causes but also through the ionic and protein loss caused by repeated punctures. The objective of talc pleurodesis is to deal with this problem: to dry up the pleural effusion.

Pleural symphysis or pleurodesis by talc spray constitutes a symptomatic treatment of choice to reduce iterative pleural punctures and thus improve the quality of life of patients. This is a technique that has proven its effectiveness and, above all, its safety with low morbidity and mortality.

Conflict of Interest: None.

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