

Chemical Pleurodesis in Malignant Pleural Effusions (MPE)

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Abstract

Introduction: Chemical pleurodesis or talc Poudrage (TP) is one of the therapeutic options of MPE performed under medical thoracoscopy that has as objective, the pleural symphysis and the drying of the pleural effusion.

Objective: To study the efficacy and safety of chemical pleurodesis.

Materials and Methods: Prospective study over three years including 46 patients with a proven or recurrent MPE with macroscopic features suggestive of neoplasia but systematically followed by biopsies. The TP carried out under TM, we used talc sterile, and the cyclins, we did not make the comparison between the two products. 82, 5% under local anesthesia (LA) and 17.5% LA + sedation. End examination by evaluation of diffusion of talc and pleural drainage.

Results: 52% women and 48% men were included, aged from 26 to 82 years with an average of 56.34y. The neoplastic history found in 76%, 24% have not neoplastic history. The breast cancer in 35%, lung in 15%, MPM in 7%, others in 20%. Good diffusion is found in 87% against 13%, a pleural drainage is applied which lasted less than 5 days in 9%; 5 days in 87%; 5 to 10 days 2%; more than 11days 2%.

The post-operative complications are empyema 2%, air leaking 17.5%, fever 10.5%, subcutaneous emphysema 4%. No distress respiratory syndrome no death. Controlling at 30 days 85.5% pleurodesis success, at 60 days 80.5% of success.

Conclusions: Palliative treatment very effective and without risk for the patient against recurrence of effusion, dyspnea, and pain in MPE.

Keywords: Pleurodesis; Malignant Pleural Effusion; Efficiency

Abbreviations

cm: Centimeter; cc: Centimeter Cube; CRP: C Reactive Protein; VS: Vitesse de Sedimentation; C°: Degrees Celsius; FES: Fraction d'ejection Systolique; PaO₂: Partial Pressure of Oxygen; PaCo₂: Partial Pressure of Carbon Dioxide; IRC: Insufficiency Respiratory Chronic; PAH: Pulmonary Arterial Hyperpressure; FEV1: Flow Expiratory Volume 1; TP: Taux de Prothrombine; l: Liter; s: Second; INR: Index Norm Ration; HTA: Hypertension Arterial; gr: Gram

Introduction

Neoplastic pleurisy has a pejorative character in the spread of cancerous disease, its early diagnosis allows a more effective action in curative or palliative therapy allowing a longer survival expectancy and a better quality of life [1].

Medical thoracoscopy, a veritable window on the pleura, is a minimally invasive procedure for the exploration of the pleural cavity that meets the objective of early, safe and effective diagnosis and palliative treatment with very promising future prospects [2].

Persistent and recurrent malignant pleurisy has a deleterious effect on the health and the general state of the patient by the dyspnea and the chest pain that it generates but also by the protein and ionic loss caused by the iterative punctures. One of the objectives of thoracoscopy is to counter this problem: Dry pleurisy.

This goal not only aims at improving the clinical and general condition, but also constitutes a real race against the clock thus allowing the introduction of a specific therapy such as chemotherapy, biotherapies and cancer immunotherapy.

Goal

To provide evidence of the efficacy and safety of chemical pleurodesis in neoplastic pleurisy.

Materials and Methods of Chemical Pleurodesis

Methods

46 patients were included in the prospective study during 03 years (01-01-2013 to 31-12-2015)

Materials and techniques

The chemical pleurodesis commonly called pleural talcage powdering is a palliative therapy of recurrent pleural effusions and pneumothorax that have not found a medical or surgical solution to their management.

The various symphysial agents are: doxycycline, minocycline, tetracycline, bleomycin, cisplatin, doxorubicin, etoposide, fluorouracil, interferon- β , mitomycin-C, Corynebacterium parvum, methylprednisolone. In our study we used oxytetracycline, doxycycline and especially talc (STERITALC *) exclusively in pleural spraying under thoracoscopy.

Cases of intra pleural instillation are not included in the study.

The goal is to create a pleural inflammatory reaction strong enough to cause a lasting pleural symphysis.

Whether the patient is recruited internally or sent by other specialized services, hospitalization is mandatory, the pre-thoracoscopic assessment is the same as for thoracoscopy for diagnostic purposes, the indication is always discussed in a team.

After performing a full thoracoscopic examination of the pleural cavity, whether pleurisy is previously proven neoplastic or not, systematic biopsies are performed.

The powdering device is currently available at any time (Availability of talc and spray device in prepared kits and sterile and calibrated Luzenak marketed by NOVATECH laboratories under the DCI Steritalc* (2, 3 and 4 gr) which allows us to perform a first intention pleurodesis as soon as possible.

The availability permanently, the pleurodesis is practiced in first intention, that is to say decided on the spot (Figure 1-3).



Figure 1: Pleurodesis with cannula, pear and talcum reservoir.



Figure 2: Full Kit of sterile talc unique use.



Figure 3: Spray for talc [3].

In the absence of talc we used oxytetracycline powder capsules 250 to 500 mg or was used between 500 to 1000 mg intra pleural spray; Doxycycline has also been used in the form of 100 to 100 capsules. 200 mg 400 to 500 mg spray.

We have followed the international recommendations for the good practice of this procedure.

The pleurodesis is said of first intention when no histo or cytological evidence of malignancy pleurisy is not available beforehand, she is performed in patients with a history of proven or former neoplasia, in remission or on treatment; but also in patients with very probable neoplasia whose evidence is difficult or impossible to make and who has persistent and recurrent pleurisy; rarely recurrent and persistent pleurisy without any neoplastic context.

After an exhaustive examination of the pleural cavity and systematic sampling, complete aspiration of the liquid of the pleural cavity, the operator assistant prepares the symphysant product (doxycycline, tetracycline, steritalc*).

For cyclins and talc in vials, a special device for powdering is included with the thoracoscopy equipment, namely: a pear pump for spraying, a powder reservoir (talc or cyclin) and a spray cannula (Figure 1).

For talc in sterile kit, no need for conventional device, the device is included in the kit (Figure 2, 3), the aid receives the kit opened by the technician, does the mounting of the device with the talc bottle which contains in general 03 gr, checks the operation and gives it to the operator.

We also used talc in pressurized flasks powered by a gas, sterile kit.

The spray cannula is introduced 12-14 cm across the trocar and the spray begins by directing the cannula through the trocar upward, downward, forward, backward. Spraying can be done under visual control if optics with an operating channel are available (Figure 4,5).

First verification with oblique optics to assess the diffusion of the product and decide to continue to open the second bottle or not (the aid must not open the second bottle before the opinion of the operator because an open bottle is a bottle lost). A second bottle is usually opened because for optimal powdering in neoplastic effusions, 03 to 05 gr are needed.

In general after the second vial the endoscopic control shows an effect "Snowstorm" (Figure 4) and homogeneous deposition at all intra thoracic structures (Figure 5). The diffusion is said to be good and the establishment of a chest drain CH 24 to 28 is carried out, pressed down to 10 - 12 cm, directed upwards most often, firmly and hermetically fixed to the skin. A test is performed on the operating table and then clamped for gentle aspiration (between -20 to -30 cm of water) and continues to the patient's bed.

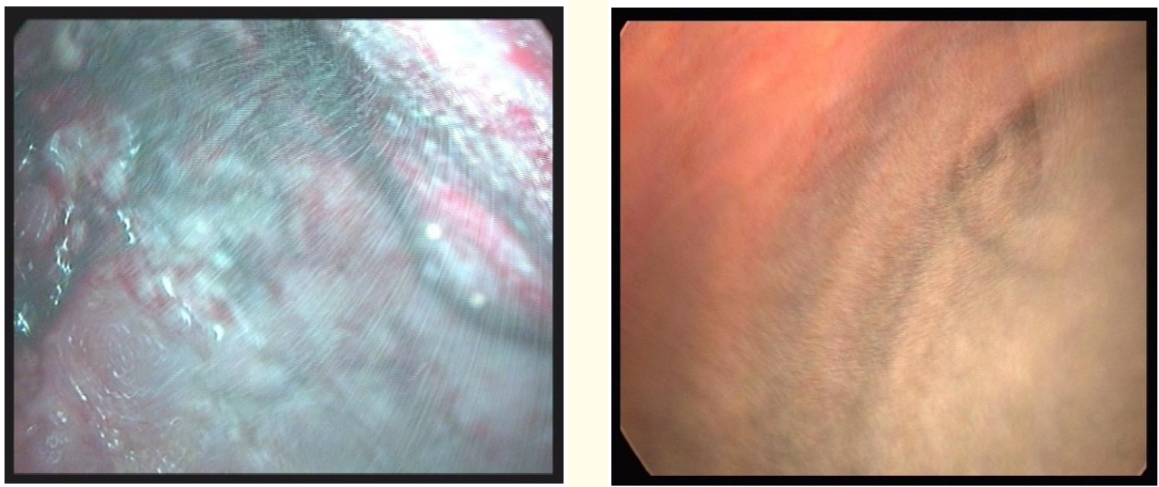
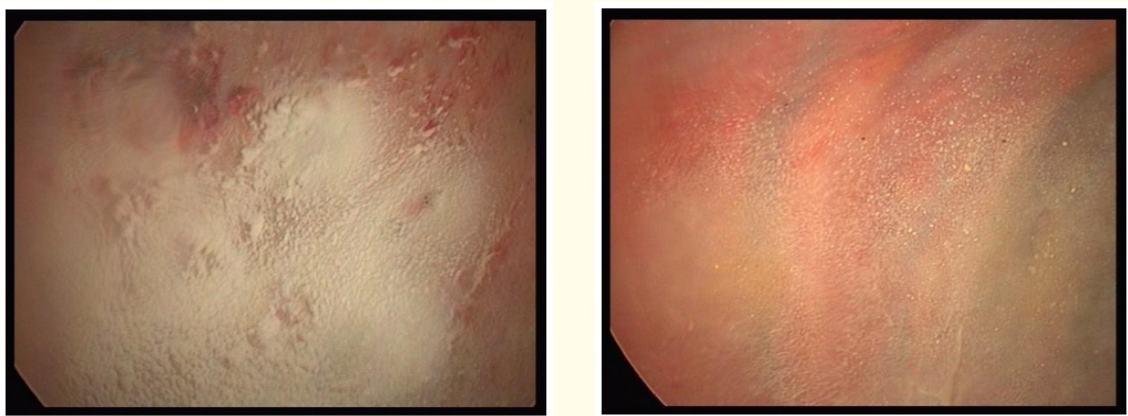


Figure 4: Effect of "snowstorm".



Pleurodesis with talcum

Pleurodesis with oxytetracycline

Figure 5: Intra pleural deposition of talc.

In pleurodesis under local anesthesia, the pain is always apprehended but not constant and the patient is warned just before spraying. We did not perform pleural anesthesia with lidocaine spray because we do not have the dedicated device for this purpose.

To manage the pain in such patients we perfuse a few minutes before a paracetamol vial, usually the pain is very short (acute inflammation of the pleura) and disappears for the rest of the pleurodesis. We found that it is during the first spraying that the pain is felt, at that moment we stop spraying for a moment, the pain fades and then disappears for the rest of the powdering.

Coughing is more rare, when it occurs, put pressure on the incision to avoid subcutaneous emphysema, stop the spray, as soon as the lull, resume cautiously; in general the rest will be good.

Can we predict the onset of pain and cough before pleurodesis? The answer is yes because in the majority of cases, in neoplastic pleurisy with diffuse fibrous thickening or diffuse pleural carcinosis there is no more room for sensitive pleural tissue and pain, as well as cough for visceral pleura, become insensitive to the inflammatory reaction not to say that there is no more inflammatory reaction; and here again the possible failure of the pleurodesis is foreseen.

Unlike “fresh” lesions with healthy pleura, therefore sensitive; the pain is very predictable, it is all the more predictable as previous systematic biopsies have been, in these cases it is preferable at this time there and not before, to inject midazolam for a light and brief sedation (action 1’30, end of action 15 - 20’) which in general causes a pain felt by the patient with total amnesia after waking (conscious sedation).

A verbal questionnaire is given to the patient at the end of each procedure with or without pleurodesis on the pain felt graded from 0 to 3 and noted on a document: 0: no pain, 1: slight pain, 2: moderate pain, 3: strong pain.

During a thoracoscopy it is not always easy to find a pleural cavity entirely accessible to exploration, one is often surprised to find bridles, veils and pleural synechia’s that prevent us from visualizing the whole cavity. This does not prevent us from precisely releasing the non-vascularized flanges and veils cautiously, which will allow us to access often the rest of the cavity, but sometimes it is impossible to go beyond because the risk and too big (Figure 6).

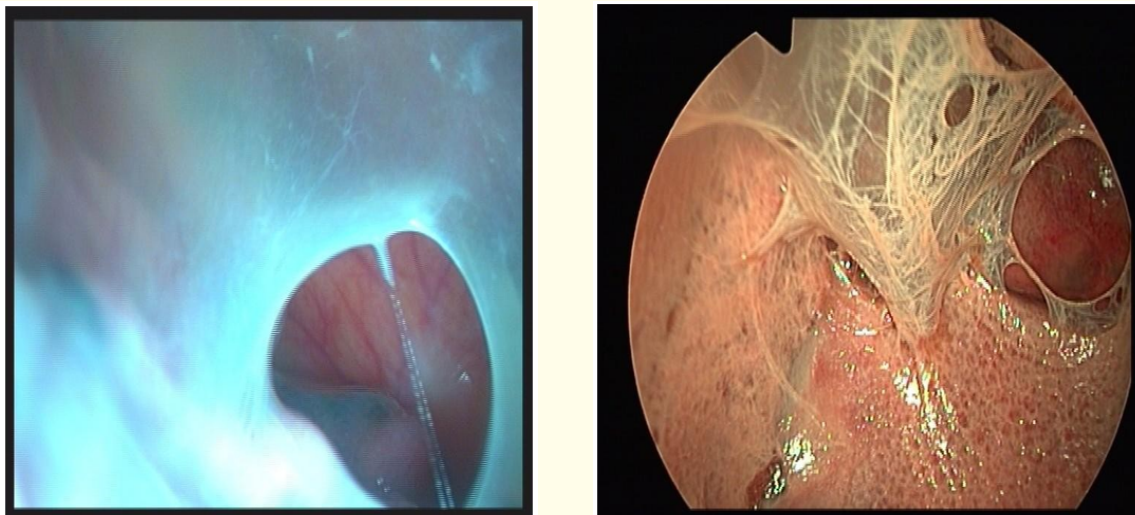


Figure 6: pleural veils

In these cases (flanges and unresectable webs) it is said that the cavity is reduced, the talc spraying is low and the deposit is limited is generally used 2 to 3 gr only.

In the patient's bed, a gentle and continuous aspiration is achieved, regular monitoring is ensured which consists of:

- Relieve pain if it occurs by prescribing analgesics on demand.
- Monitor the occurrence of a fever and report it, usually a fever of 38 to 38.5°C which does not last more than 24 to 48 hours.
- Note the presence or absence of air bubbles in the suction jar.
- Quantify the quantity and quality of the liquid brought back into the jar by 24 hours.
- Report subcutaneous emphysema especially if the patient is coughing.
- Report the onset or worsening of dyspnea.
- Carry out an X-ray on the 4th or 5th day of aspiration.
- We did not measure biomarkers of inflammation like VS and CRP.

The dreaded complications fortunately exceptional are:

- Respiratory distress
- Pulmonary embolism (gaseous or cupric)
- Infection or empyema

Fever, pain, subcutaneous emphysema, and persistent pneumothorax are rare, minor and usually minor accidents.

After 04 to 05 days of aspiration, if there is no pneumothorax and if the amount of liquid brought back into the jar is less than 100 cc/24 hours, the drain can be removed, in the negative the drainage will be maintained.

No antibiotic therapy is prescribed, only symptomatic drugs (analgesics, antipyretics) are allowed, low preventive molecular weight heparin is routinely prescribed as well as physiotherapy. Corticosteroids, except in cases of it necessary, are not recommended because they may compromise the pleurodesis.

The patient can leave the hospital, he will remove the sutures within 08 days, a radiological check is carried out at 15 days, 30 days and 60 days to evaluate the symphysis (success) or the recurrence of the effusion (failure).

Powdering is successful if there is no recurrence of fluid so no more puncture on the 30th and 60th day. Do not forget that all our patients have a progressive cancer, old, some under chemotherapy, others will start it and others will be in therapeutic failure or it is dangerous and often a general state that gradually deteriorates; therefore the limit of 60 days of evaluation is not always achieved.

We will talk about the failure of pleurodesis when the liquid recurrence and evacuation punctures are necessary to relieve the patient before the 30th day.

Patients who have undergone pleurodesis, whether first-line or second-line, are in any case discussed in a multi-disciplinary consultation meeting for continuation or further treatment with oncologist physicians, as medical follow-up long-term care is provided by non-oncologist confreres either in the framework of the follow-up of a chemotherapy, or in the framework of a palliative therapeutic essentially analgesic.

The biopsy fragments are counted, measured, put in formalin, a carefully completed anatomopathological examination request form with clinical, radiological details and above all a detailed description of the macroscopic lesions very useful for the anatomopathologist.

The specimens must be sent to a laboratory of pathological anatomy very trained in pleural pathology or there is a team work, with staining panel in immunohistochemistry and immuno-labeling of tumor receptors and biomolecular studies. Our samples were sent to the pathology anatomy unit of Blida University Hospital.

The indications

All persistent or recurrent pleurisy or pleural thickening that meets the inclusion criteria of this study.

Contraindications

At the end of these reports, medical thoracoscopy is:

Against indicated in:

- Absence of pleural or insufficient delamination less than 10 cm;
- Performances status scale greater than 2;
- Myocardial infarct < at 03 months;
- Angora unstable;
- Heart failure with FES < 35% with or without diastolic relaxation disorders
- Refractory heart rhythm disorders;
- Constrictive pericarditis;
- Deep Venous thrombosis untreated;
- IRC with $\text{PaO}_2 < 65$ mmHg and $\text{PaCO}_2 > 50$ mmHg or $\text{Sa O}_2 < 90\%$ in air and $< 94\%$ under O_2 ; PAH > 50 cm;
- FEV1 $< 50\%$ of normal or less than 1.5 l/s;
- Diffuse pulmonary fibrosis;
- Chronic Renal Failure in the non-dialyzed end stage;
- Allergy to anesthetics;
- Lateral decubitus impossible and arthrodesis of the shoulder (relative);
- Categorical refusal of the patient;
- Severe psychiatric disorders;
- TP $< 60\%$ and INR > 2 and platelet count $< 60,000/\text{mm}^3$.

Against indicated temporarily in the presence of:

- Cough;
- Fever;
- Abundant bilateral pleural effusion;
- Bleeding disorder controllable;
- Diabetes imbalanced;
- HTA;
- Uncontrolled asthma.

Results

Distribution by age and sex

Ages-Sex	Number	%
Men	22	48
Women	24	52
Total	46	100
Age maximal	82	
Age minimal	29	
Average age	56,34	

Table 1: Sex and age distribution.

The female sex is a little more concerned than the men with 52% of the cases, the average age of patients who have benefited from this pleurodesis is 56.34 years with extremes of 29 and 82 years.

Neoplastic history

History	Number	%
Breast	16	35
Bronchial lung	7	15
Mesothelioma	3	7
Ovary	3	7
Sarcoma	3	7
Gastric	1	2
Bladder	1	2
Melanoma	1	2
No history	11	24
Total	46	100

Table 2: Neoplastic history.

Breast cancer in women is the main indication with 35% of cases followed by pleurisy that had no histological malignant status and in whom the gesture was for diagnosis at the same time therapeutic first-line in 24% of cases . The pleurodesis for metastasis of bronchial cancer was performed in 15% of cases.

In all cases systematic biopsies are performed.

Type of Anesthesia

Type of Anesthesia	Number	%
Local	38	82,5
Local + Sedation	8	17,5
Total	46	100

Table 3: Type of anesthesia.

The main inconvenience felt by some of our patients during chemical pleurodesis is pain preceded by anxiety.

Local anesthesia was used in all cases, in 17.5% (08) of our patients mild sedation with IV midazolam was added.

Macroscopic data

Extent of injuries

Lesions	Number	%
Diffuse	44	96
Located	2	4
Total	46	100

Table 4: Extent of lesions.

The diffuse appearance of the lesions testifies to the evolved nature of the disease, but it also makes it possible to predict the success or probable failure of the pleurodesis, as well as the painful effect of the dusting.

The spread of lesions was found in 96% of cases.

The macroscopic aspect

Aspects of lesions	Number	%
Evocatives	42	91
Non-Evocative	4	9
Total	46	100

Table 5: Macroscopic aspects.

The suggestive aspect of pleural carcinomatosis was mentioned in 91% of the cases i.e. 42/46 patients.

The pleurodesis

The time of the pleurodesis

Talcage I or II	Number	%
First intention	38	82,5
Second intention	8	17,5
Total	46	100

Table 6: Pleurodesis time.

In 38 patients (82.5%), pleurodesis was performed in the first intention, that is to say a therapeutic and diagnostic procedure at the same time, and in 17.5% after previous histological evidence by needle biopsy or thoracoscopy.

Duration of the pleurodesis procedure

Time (minutes)	Number	%
10 - 15'	13	28
16 - 20'	16	35
21 - 25'	8	18
26 - 30'	7	15
31 - 35'	2	4
Total	46	100

Table 7: Duration of the operation.

The duration of thoracoscopy with pleurodesis (which includes exploration, resections of veils and flanges, biopsies and dusting) is less than 20 minutes in 63% of patients (29/46) and is less than 30 minutes in 96% of patients (44/46).

The products used

Product	Number	%
Talc	38	80
Doxycycline	8	20
Total	46	100

Table 8: Product used.

Sterile talc is our preferred product, it was used in 80% of patients, failing which, at the beginning of our work, doxycycline was used in 08 patients.

The dose of the product

Talcum

Dose of Talcum	Number	%
3gr	9	23,5
4gr	2	4
5gr	27	82,5
Total	38	100

Table 9: Dose used.

5 gr of talc is usually used in intra pleural spraying for largely free cavities, 82.5% of our patients have benefited from this dose and 23% due to the cramped cavity received only 03 gr.

Doxycycline

Dose Doxycycline	Number	%
500 mg	6	75
600 mg	2	25
Total	8	100

Table 10: Dose Used: Doxycycline.

For Doxycycline pleurodesis only used in 08 of our patients, 500 mg were sprayed in 75% of patients and 600mg in 25%.

Dissemination of the product

Broadcast	Number	%
Good	40	87
Poor	6	13
Total	46	100

Table 11: Product dissemination.

The quality of diffusion of the product is judged at the end of thoracoscopic visceral pleurodesis, it is said poor when the product cannot spread properly throughout the cavity, it happens when there are sails and flanges, it is called good when the product diffuses throughout the cavity. In our series the diffusion of the product is good in 87% of the cases and bad in 13%.

Intraoperative incidents

Pain intensity	Number	%
Absent: 0	36	78,5
Light: 1	8	17,5
Moderate: 2	2	4
Total	46	100
Sedation	8	17,5

Table 12: Intraoperative incidents.

The symphytant product is known to be allogenic especially when the lesions are localized or scattered, in our series a verbal and visual evaluation of the pain from 0 to 3 was done and showed that 78.5% of our patients did not feel pain in associating patients who had been sedated. 17.5% had mild pain and 4% had moderate pain.

The duration of the drainage

Removing the drain	Number	%
On site	4	9
0 - 5 days	40	87
6 - 10 days	1	2
11 days and more	1	2
Total	46	100

Table 13: Duration of drainage.

Pleural drainage in pleurodesis lasted 05 days in 87% of cases, in 04 cases the drain was removed on site due to the cramped cavity and lasted more than 11 days in one case.

Postoperative complications

Complications	Number	%
None	30	65.5
Prolonged bulling	8	17,5
Fever	5	10.5
Emphysema/skin	2	4
Sepsis	1	2
Bleeding	0	0
Respiratory distress	0	0
Death	0	0
Total	46	100

Table 14: Postoperative complications.

No complication was observed in 65.5% of patients, some minor complications were observed and cured by appropriate measures such as prolonged bubbling beyond 48 hours in 17.5%, fever in 10.5% of cases, 2 cases of subcutaneous emphysema is 4% of cases, 01 cases of sepsis. We did not deplere any major complication such as death, acute respiratory distress, or hemorrhage.

The final histological diagnosis

Final Diagnosis	Number	%
Breast	16	35
Lung Cancer	15	33
Malignant Mesothelioma	4	9
Sarcomas	3	7
Unknown adenocarcinoma	2	4
Ovary	3	7
Melanoma	1	2
Bladder	1	2
Inflammatory	1	2
Total	46	100

Table 15: Histological result.

During a thorascopic procedure followed by pleurodesis, systematic pleural biopsy is performed, we note that pleurodesis involved breast cancers with 35% of cases followed by bronchial cancer with 33%, malignant pleural mesothelioma with 9%.

The results of pleurodesis and become patients

15 days results

Result to 15 days	Number	%
Good	44	95
Failed	2	5
Deceased	0	0
Lost Sight (POS)	0	0
Total	46	100

Table 16: Results at 15 days.

A systematic check is carried out 15 days after the discharge of the hospital, only 02 of our patients have had a failure i.e. a recurrence of the liquid requiring evacuation punctures, the rest is 95% the control is good therefore no recurrence of the liquid, a pachypleuritis is installed. The success of pleurodesis can only be declared after 30 days.

30 days result

Results 30 days	Number	%
Good	37	84
Failed	2	4,5
Lost sight	2	4.5
Death	3	7
Total	44	100

Table 17: Result of the pleurodesis: 30 days.

Regardless of the underlying neoplastic disease that continues to evolve outside palliative chemotherapy, pleurodesis is intended to prevent the reconstruction of pleural effusion and therefore painful and exacting iterative pleural punctures. 84% (37/46) of our patients did not need to make punctures after 1 month post powdering; there was 4.5% (02) of recurrence failure after powdering, 7% (03) of deaths and 4.5% (02) of lost vision (considered as failure in our calculations). Excluding deaths, the success rate will be 90% (37/41).

60 days result

Result at 60 days	Number	%
Good	30	81
Failed	0	0
Death	2	5.5
Lost Sight (POS)	5	13.5
Total	37	100

Table 18: Result of the pleurodesis: 60 days.

Among the 37 successful pleurodeses in the first month, a 60 day check was performed which showed the maintenance of good pleurodesis without any need to resort to punctures in 30 patients or 81% of cases. 05 lost sight of 13.5% and 02 deaths. Excluding the 02 deaths, the success rate is reported at 85.5%.

1 year result

Result at one year	Number	%
Good	13	43
Failed	0	0
Deceased (DCD)	10	33
Lost Sight (POS)	7	24
Total	30	100

Table 19: Result of the pleurodesis: 1 year.

Of the 30 patients monitored at 1 year, 13 or 43% controlled with a successful and durable pleurodesis, the number of lost to follow-up is high after one year of follow-up, it is 24% of the initial strength. 33% of deaths (10 patients) during the year of follow-up. If we exclude deaths, we will obtain as a result of 65% of success (the loss of sight are counted among the failures).

The final result

End result	Number	%
Good	10	22
Failed	0	0
Deceased	14	30
Loss of View (POS)	22	48
Total	46	100

Table 20: Final result.

At the end of the study on 31-12-2015, 10/46 patients, that is to say 22% of the initial staff were still alive and followed up with no recurrence of the fluid, 02 patients in 2013, 03 patients in 2014 and 05 patients of 2015. 14 (30%) patients died of their disease and 48% were lost to follow-up. The success rate of powdering at 31-12-2015 excluding deaths is 10/32 or 31%.

Discussions

The epidemiological profile of patients and procedures

Procedures of powdering	Sotim [4] N = 558	Kolschmann [5] N = 102	R-Baker [6] N = 168	Our study N = 46
Average Age	64 years	66 years	62 years	56.34
Sex	M 51% F 49%	57% 45%	48% 52%	48% 52%
Anesthesia	Local 78% Sedation 22%	100% -----	100% -----	82.5% 17.5%
Entrance Door	1 by 77% 2 Doors 23%	100% -----	100% -----	100% -----
Product	4gr Talc	8gr Talc	Talc 5-6 gr	80% Talc 5gr 20% Cyclin
Cancers				
Lung	43%	47%	29%	33%
Breast	22%	15.7%	20%	35%
Mesothelioma	15%	9.8%	15%	9%
Urogenital	6%	10%	---	9%
Lymphomas	3%	2%	8%	---
Digestive	3%	5%	-----	-----
Melanoma	2%	0%	-----	2%
Unknown	3%	7%	7%	4%
Withdrawal drain	4 days	6 days	5 days	5 days

Table 21: Comparative study of thorascopic pleurodesis.

In our study we note a female predominance with 52% and the average age is the lowest of the literature series with an average age of 56.34 years results comparable to those of Rodriguez-Panadero, these data are related to the Indications of powdering in breast cancer that is seen at a younger age. The extremes between 29 and 82 years old are comparable to the literature.

In our series our patients had a history of breast cancer in 35% of cases followed by bronchopulmonary cancer in 15%, mesothelioma, ovarian and sarcomas in 7% for each, followed by other cancers were included for diagnostic confirmation and pleurodesis.

24% (11 cases) with no previous history of neoplasia benefited from a first-line pleurodesis for macroscopic tumor appearance similar to the literature in the work of Duteau [11], Fr-Panadero [7], Scherpereel [8], Loddenkemper [9] and Boutin [10].

Local anesthesia was sufficient in 82.5% of patients, a conscious sedation was added in 17.5%. This demonstrates that local anesthesia is sufficient to perform the procedure however it is noted that in the prospective study Sotim [4] which includes 14 centers, 22% of procedures use in addition to local anesthesia sedation or general anesthesia. Mild sedation is widely recommended in routine exploration situations as recommended in the literature [11,12].

The procedure is a little longer than diagnostic thoracoscopy since 63% lasted between 10 and 20 minutes and 37% over 20 minutes.

In 80% of the sterile talc was used 05 grams in spraying and only in 20% of the doxycycline at the dose of 3gr. Our preference is for talc, which has demonstrated its superiority in all series [13,14], we have used cyclins as the default for talc.

The main inconvenience expected is the pain that was assessed postoperatively, it was absent in 78.5% including the 17.5% of sedated patients. It was mild to moderate in 21.5% of cases.

The drainage is systematic it was maintained 05 days in 87% of the cases, removed on the spot in 4 cases (9%) because of the exiguity of the cavity, the drain has all sucked on the operating table (a total of 96% withdrawals in less than 5 days). In more than six days in 4%. Results identical to the literature.

Incidents and complications of pleurodesis

Complications	De Campos JR [15] N = 614	F Panadero [6] N = 411	Kolschmann [5] N = 102	Our study N = 46
Pain	2%	10.5%	80%	21.5%
Fever	2.7%	-----	28.4%	10.5%
Empyema	2.7%	1.9%	1%	2%%
Subcutaneous emphysema	0%	9.4%	0%	4%
Bleeding	0.4%	0.7%	0%	0%
Prolonged bulling	4%	3%	1%	17.5%
Respiratory distress	1.3%	0.2%	0%	0%
Death	0%	0%	0%	0%

Table 22: Comparison of complications of pleurodesis.

No major postoperative complications were observed including acute respiratory distress and death. However, there were minor classic complications such as prolonged bubbling in 17.5% of cases, fever in 10.5%, subcutaneous emphysema in 4% and 01 cases of sepsis. Our data are comparable to those in the literature. Our series has demonstrated, in the same way as the literature series, the safety of pleural powdering.

In some cases, the thoracoscopy had a diagnostic and therapeutic indication, 24% of the starting thorascopies were made without initial histological diagnosis and subjected to powdering, the systematic biopsies carried out showed in finite: 35% of breast cancers, 33% of bronchopulmonary cancers, 9% mesotheliomas, 7% sarcomas, 15% other cancers and 01 cases of non-specific pleural inflammation in a patient with a history of cancer.

The therapeutic result

Result of the powdering	Vialat [16] N = 360	Kolschmann [5] N = 102	Rodriguez-Baker [17] N = 168	Our study N = 46
At 30 days	88.5%	89.4%	92.8%	90.2%
At 60 days	-----	83.1%	-----	81%
At 180 days	-----	82.6%	-----	-----
At 1 an	-----	-----	-----	65%

Table 23: Compared results of pleurodesis.

It is important to note that patients have progressive malignancies and that pleurodesis is only a palliative treatment and is often associated with other therapeutic modalities such as chemotherapy.

In our series, 84% (37/46) of pleural symphyses were obtained during the first month, this result is objectified by the absence of need for a pleural puncture, by the absence of dyspnea, by clinical examination. and especially the radiological examination. There were 03 deaths due to the disease within 30 days of surveillance, 02 (4.5%) failures requiring iterative punctures and 02 LOS.

In fact, excluding deaths (03) in less than 30 days, the success rate is 90.2% (37/41) and 4.5% failure. The loss of sight (02) will be considered as a failure. Comparable figures with the literature.

The control of the efficacy of pleurodesis was continued for the 37 patients, 02 patient died and 05 lost to follow-up, the remaining 30 patients did not need any pleural puncture and the chest X-ray notes the installation of a pachypleuritis without pleurisy which brings to 81% of success in 60 days.

The control continued until 01 year, no puncture was necessary in 13 patients, no failure among the patients followed, 10 (33%) of patients died and 24% patients lost sight of. Excluding deaths, the success rate will be 65%. The loss of views considered as failure. All deaths are due to the evolution of the initial disease.

The follow-up to 1 year in the literature is rare, we find that at 06 months Kolschmann found 82.6% success.

At the end of the study on 31-12-2015, 10 or 22% of the initial strength were still alive without recurrence of the effusion.

- 02 patients included in 2013 still alive without recurrence (01 malignant mesothelioma, 01 bronchopulmonary adenocarcinoma, 01 breast cancer).
- 03 2014 patients still alive 02 breast cancer and 01 lymphoma
- 05 2015 patients still alive 03 breast cancer, 01 ovarian cancer, 02 lymphomas.

Of the 40 patients with known history of neoplasia, 11 (27.5%) were downgraded to medically treated benign pathology (02 tuberculosis, 01 operated for adenocarcinoma without pleural involvement, 08 inflammatory).

All 49 patients with no history of malignancy were referred to medical oncology for oncology and palliative treatment.

Conclusion

Objective assigned to the chemical pleurodesis or pleural powdering in per-thorascopic spray which proved its effectiveness in more than 80% of all the world series and especially its safety with a mortality almost nothing.

Our study found the same results as those described in the literature including procedures, efficiency and safety.

The medical thoracoscopy makes it possible to proceed immediately to a pleurodesis in case of strongly evocative aspects of carcinosis allowing a saving of time, cost and procedures.

As predicted by Jacobaeus more than a century ago, the prospects for medical thoracoscopy are great especially in the management of malignant pleurisy by the endoscopic treatments to be developed in our country such as cryotherapy, electron therapy, Dynamic photo treatments of cancers and endoscopic fluoroscopy.

Conflict of Interest

No conflict of interest.

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