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METASTATIC PLEURISY: EPIDEMIOLOGICAL, CLINICAL AND THERAPEUTIC ASPECTS

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ABSTRACT
Our work is a retrospective study over 3 years, relating to 40 cases of neoplastic pleurisy collected at the oncology department of the Moulay Ismail Meknes military hospital during the period from January 2017 to December 2019. We examined the epidemiological and clinical profile. and etiological, as well as the therapeutic modalities of this affection. The ages of our patients ranged from 50 years to 86 years with an average age of 62.75 years and a clear predominance of men (sex ratio = 7). The average consultation time was 66.02 days on average. The functional signs were dominated by dyspnea in 87.5% of cases. Clinical fluid effusion syndrome was present in all patients. Surgical thoracoscopy allowed histological diagnosis in 75% of cases. The aetiologies were dominated by lung cancer in 55% of cases followed by breast cancer in 20% of cases. Treatment was based on repeated pleural punctures (35%), placement of a tunneled pleural drain (7.5% of cases) and pleural talcage (75% of cases). Systemic treatment of neoplastic pathology depended on the location and histological type of the tumor. Overall survival was on average 6.6 months.

KEYWORDS: Surgical thoracoscopy allowed histological diagnosis in 75% of cases.

INTRODUCTION

Metastatic pleurisy is defined as the presence of tumour cells in the pleural fluid. They may occur at the same time as the diagnosis of tumour disease or during its progression.[1]

This is a frequent occurrence, with one in two patients with metastatic cancer developing pleural effusion.[2]

Breast and lung cancers, which are the leading causes of cancer deaths in women and men respectively, account for around 50% of neoplastic pleurisies, and adenocarcinoma is the most common histological type.[3,4]

Neoplastic pleural effusion is a poor prognostic factor, with a median survival of around 4 months and a 1-year survival of around 15%, although prolonged survival may be observed, particularly in metastatic pleurisy from breast cancer.[5] Malignant pleural effusions are common, with significant morbidity and impairment of quality of life. They pose two problems: diagnostic management and palliative treatment of dyspnoea. The choice of treatment for malignant pleurisy takes into account the cancer of origin, patient's general condition, the symptoms presented and the patient's expectations.

Treatment may or may not consist of two components: a local treatment and a general treatment.

Pleural symphysis or pleurodesis is the local treatment of choice. To obtain pleurodesis, talcation under thoracoscopy is widely used throughout the world.[6,7,8,9]

Chemotherapy and radiotherapy constitute the general treatment for metastatic pleurisy, the protocol for which is determined by the nature of the primary tumour. We report on the experience of the oncology department of the Moulay Ismail Military Hospital in Meknes in the management of metastatic pleurisy. The aim of our work is to demonstrate the role of oncology in the management of neoplastic pleurisies, and to identify their main aetiologies, as well as the radio-clinical profile, while comparing our results with the data in the literature.

PATIENTS AND METHODS

I. *Study material*

1. Type of study

This is a retrospective descriptive study of 40 patients, carried out in the medical oncology department of the Moulay Ismail Military Hospital in Meknes. This study is spread over a period of 3 years, from September 2017 to September 2019.

2. Inclusion

The inclusion criteria for our sample were as follows.

- Presence of malignant pleurisy confirmed by analysis of pleural fluid or pleural biopsies.
- Pleurisy occurring in a neoplastic context.
- presence a clinical file listed in the oncology department the Moulay Ismail Military Hospital in Meknes.

3. Exclusion Criteria

The exclusion criteria were as follows.

- Non-malignant pleurisy.
- Unusable files.

II. *Study: (APPENDIX I)*

Data were collected from patients' medical records in the archives of the oncology department of the Moulay Ismail Military Hospital in Meknes. The data collected were as follows.

- Age and gender,
- Respiratory and extra-respiratory pathological history,
- Clinical data,
- Paraclinical data,
- Treatment methods,
- Survival.

III. *Statistical analysis*

- Statistical analysis of the data was carried out using Microsoft Office Excel and SPSS.
- Qualitative variables are expressed as frequencies and percentages.
- Quantitative variables are expressed as median, mean and standard deviation.

RESULTS

I. EPIDEMIOLOGY

1. Breakdown by year

Over a period of 3 years, September 2017 to September 2019, collected 40 patients with metastatic pleurisy :

- A peak of 19 patients was recorded in 2018.
- A minimum of 10 cases in 2017.

Table 1: Distribution of neoplastic pleurisy cases collected at the oncology department of the Moulay Ismail Military Hospital in Meknes from 2017 to 2019.

	N	%
2017	10	25
2018	19	47.5
2019	11	27.5

2. Age Admission

The mean age at the time of discovery of the pleurisy was 62.75 years, with a standard deviation of 13.81. The extremes ranged from 50 to 86 years, with a concentration of cases (60%) in the[50-70] age group.

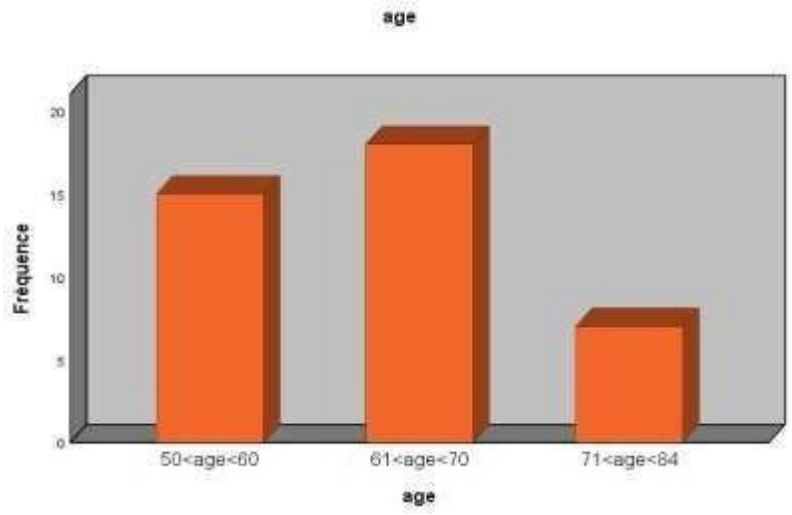

Figure 1: Breakdown of patients by age group.

3. Breakdown of the population by gender

Of the 40 patients in our study, men accounted for 87.5% (35 cases) and women 12.5% (5 cases), with a sex ratio (M/F) of 7, i.e. a clear male predominance.

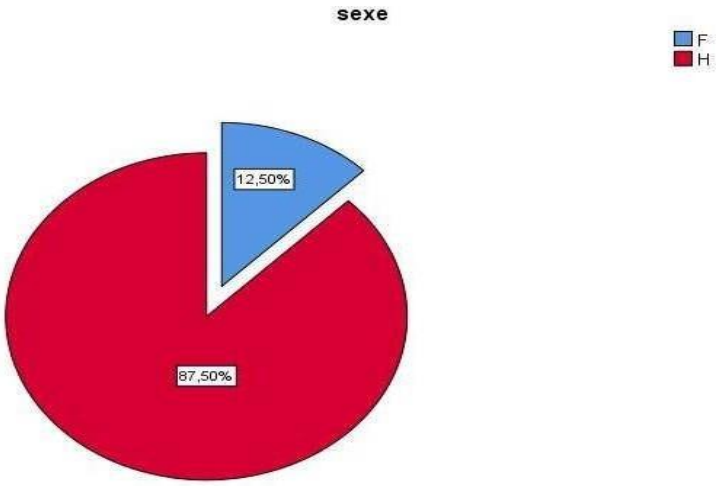

Figure 2: Breakdown of patients by gender.

II. PATHOLOGICAL ANTECEDENTS

Analysis of the history of the patients in our series revealed the following results.

1. Medical and toxic history

- 30 smoking patients (75%).
- 16 hypertensive patients (40%)
- 20 diabetic patients (50%)
- 2 cardiac patients (4%)
- 1 patient treated for kidney disease
- 3 patients with a history of tuberculosis.

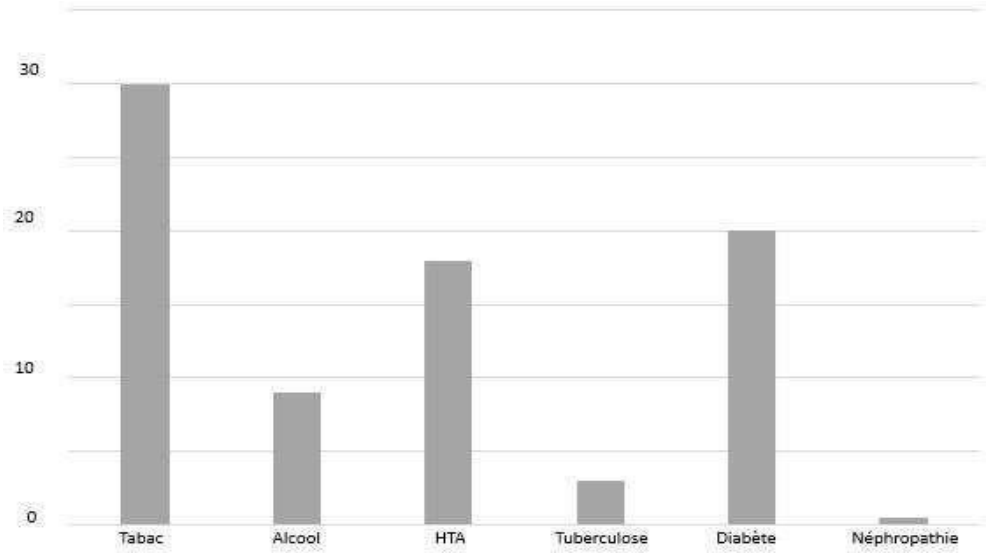

Figure 3: History and associated defects.

2. Surgical history

- 1 patient operated for cholecystitis
- 2 patients operated on for appendicitis
- 1 patient operated on for fracture of the left leg

III. CLINICAL

1. Average consultation time

This parameter was specified in 40 cases, varying from 5 days to 360 days, with an average delay of 66.02 days (standard deviation 75.262 days).

Table 2: Distribution of cases of neoplastic pleurisy collected from 2017 to 2019 in the oncology department of the Moulay Ismail Military Hospital in Meknes, according to the time between symptoms and hospitalisation.

		Fréquence	Pourcentage
Valide	16-30	2	5,0
	31-45	2	5,0
	40-60	3	7,5
	46-60	5	12,5
	60-75	7	17,5
	60-78	1	2,5
	76-90	7	17,5
	sup a 90	13	32,5
	Total	40	100,0

2. General Condition

In our study, more than half of our patients were in poor general condition (28 cases, i.e. 70%), compared with 14 patients in good general condition (27.50%), while the condition of one patient was unclear (2.5%).

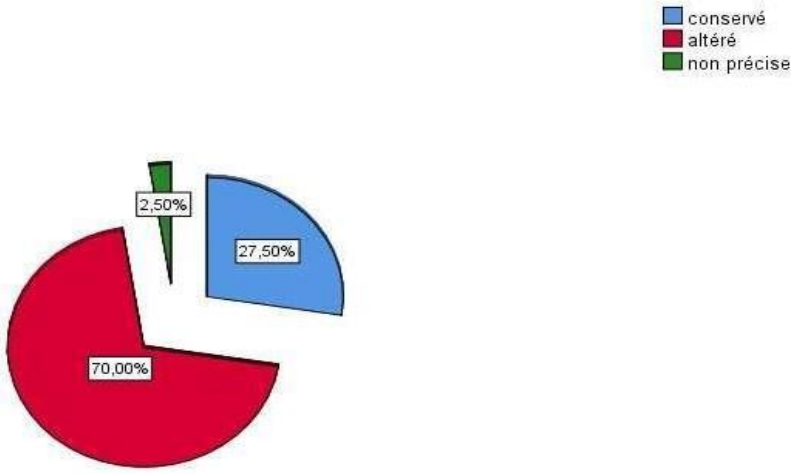

Figure 4: General condition of our patients.

3. Functional Signs

Functional signs in our study were dominated by dyspnoea, followed by chest pain and haemoptysis.

- 35 patients (87.5%) had dyspnoea.
- 19 patients (47.5%) had chest pain.
- 4 patients (10%) had a dry cough.
- 15 patients (37.5%) had haemoptysis

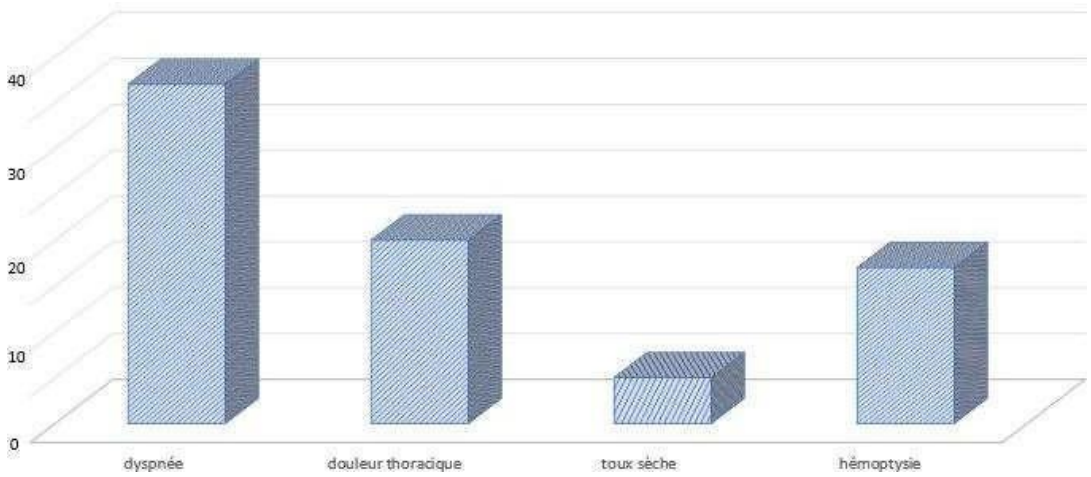

Figure 5: Functional signs in our patients.

4. Clinical examination

Clinical examination revealed

- A fluid effusion syndrome in all patients (100%).
- Crackling rales in 02 patients.

IV. PARACLINICAL

A. Imaging

1. Chest X-ray

All patients had several chest X-rays

- ✓ To make a positive diagnosis
- ✓ For information on the state of the lung parenchyma
- ✓ Pre-operative and post-operative
- ✓ To monitor development.

a. Abundance of pleurisy

The chest X-rays studied showed pleurisy of great abundance in 10 patients (25%), of moderate abundance in 10 patients (25%) and of small abundance in 20 patients (50%).

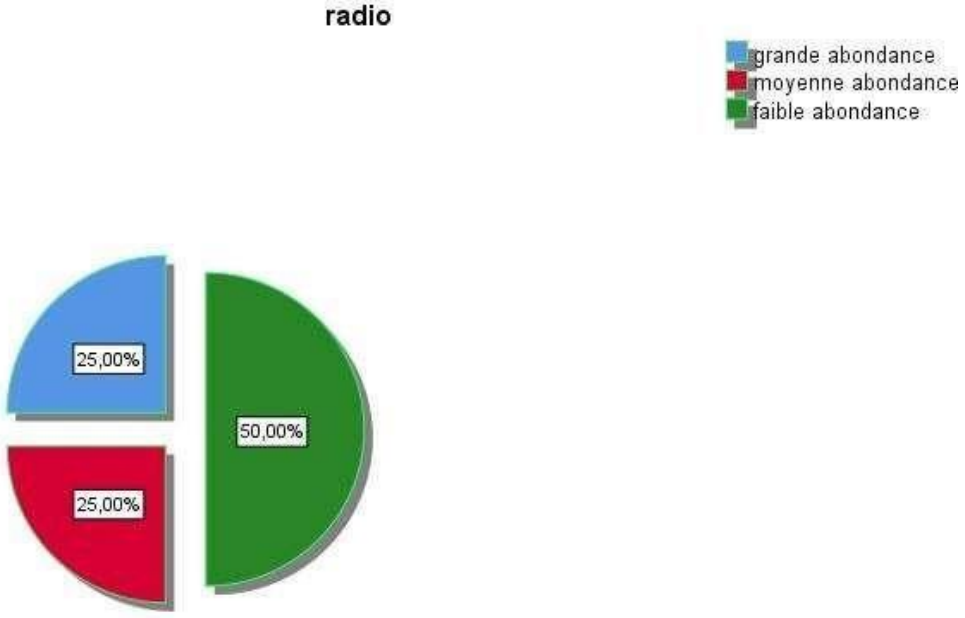

Figure 6: Distribution of pleurisy according to severity.

b. Location of pleurisy

Pleurisy occurred in the right hemithorax in 10 patients (25%), in the left hemithorax in 9 patients (22.50%) and bilaterally in 21 cases (52.50%).

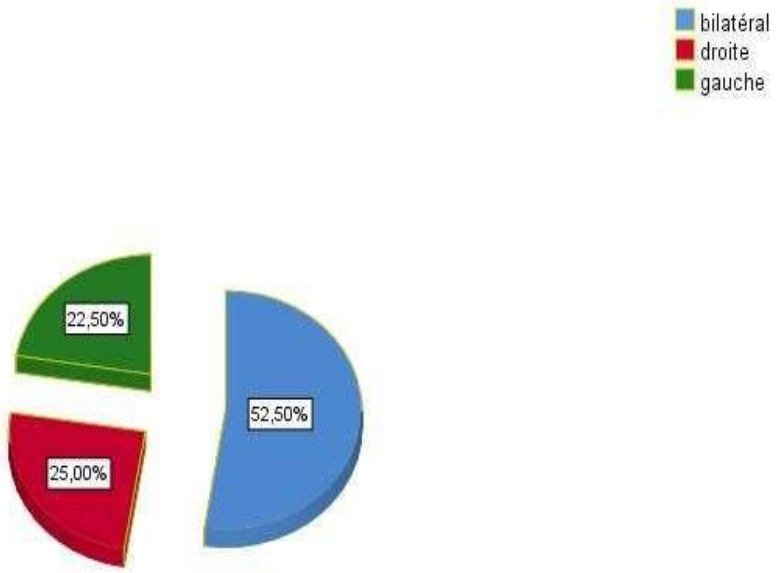

Figure 7: Distribution of pleurisy according to location.

Iconography showing the different radiological aspects.

Figure 8: Right pleural effusion of moderate size (Oncology Department, HMMI, Meknes).

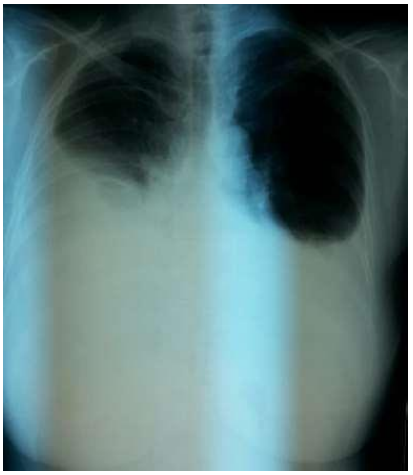

Figure 9: Bilateral pleural fluid effusion. (Oncology, HMMI, Meknes).

2. Thoracic ultrasound

A total of 40 patients thoracic ultrasound.

The following is a summary of the different ultrasound findings in these patients.

Table 3: Frequency of ultrasound signs in our series.

Image échographique	Nombre de cas	Pourcentage des patients
Pleurésie libre minime	10	25
Pleuresie moyenne abondance	10	25
Pleurésie libre Abondante	20	50
Epaississement pleural	16	40
Epanchement péricardique	1	2.5

3. Chest computed tomography

Thoracic CT scans provide a better view of the lung parenchyma and are used to guide thoracoscopy, as they are better able to pinpoint the location of the effusion.

The lesions observed are summarised in the following diagram

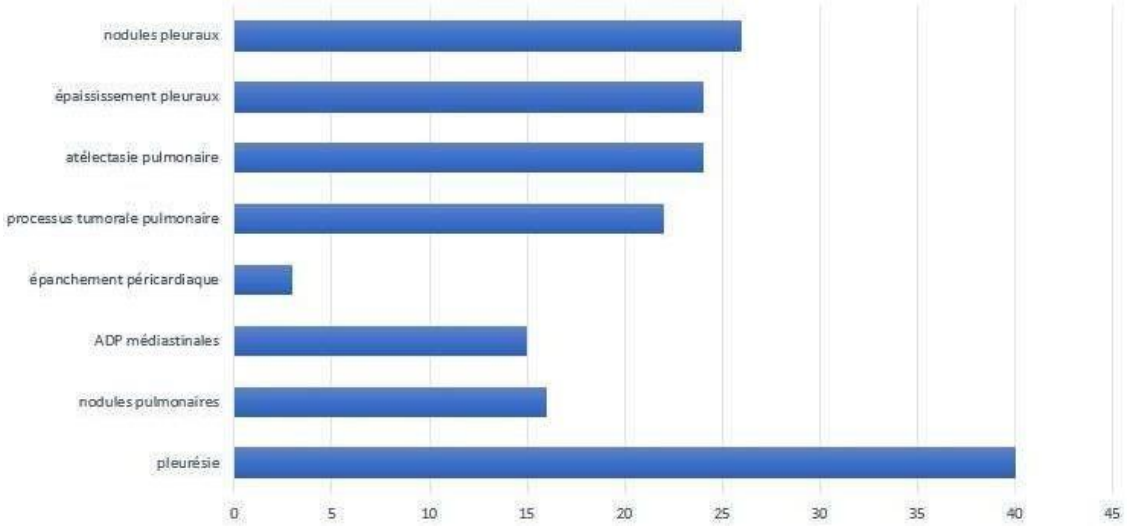

Figure 10: Radiological findings examination.

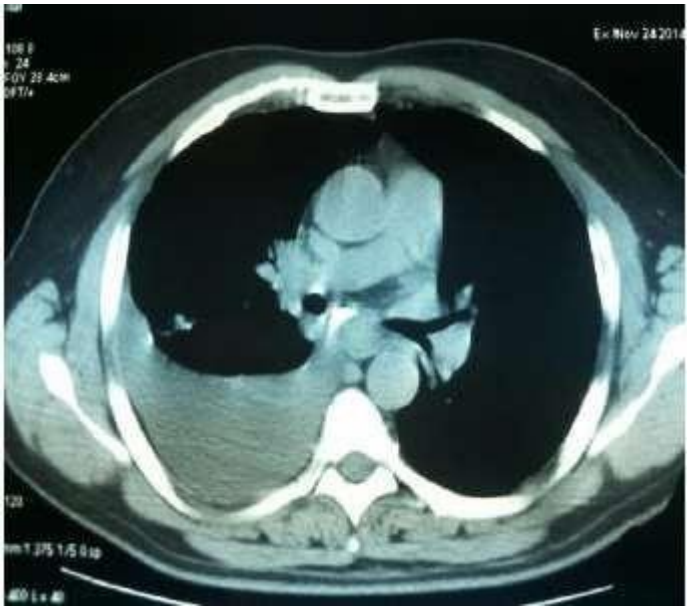

Figure 11: Chest CT scan with mediastinal window showing a right pleural effusion of moderate size. (This is a pleural metastasis of bronchopulmonary cancer). (Radiology Department, HMMI, Meknes).

B. Cytology -Histology

1. Techniques and results

a. Pleural puncture

In our series, 40 patients (100%) underwent pleural puncture.

b. Blind pleural biopsy

Blind pleural biopsy performed in 10 patients (25%).
Video-assisted surgical thoracoscopy (VATS): Performed on 30 patients (75%).

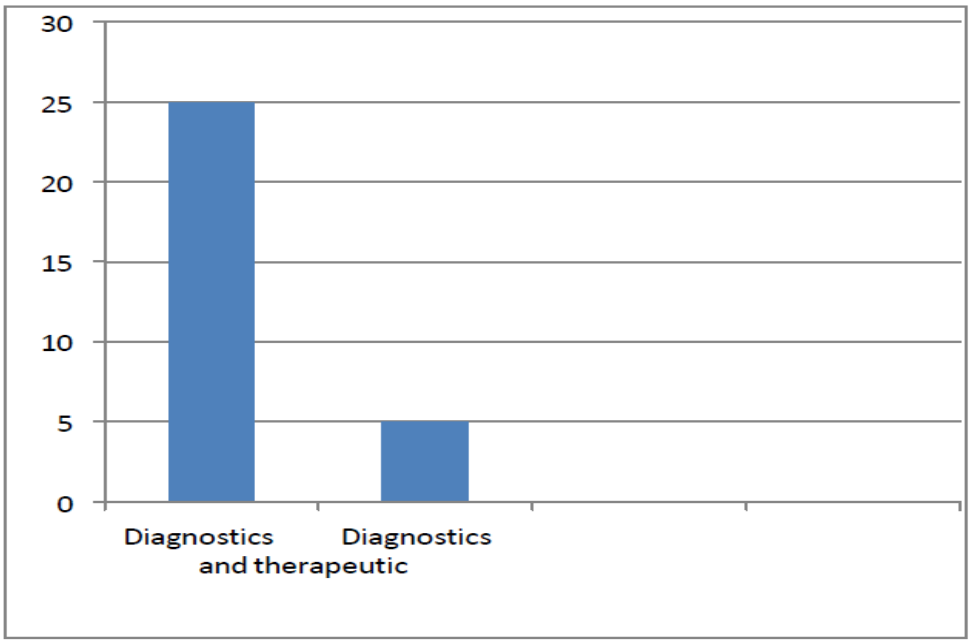

Figure 12: Indications for video-assisted surgical thoracoscopy.

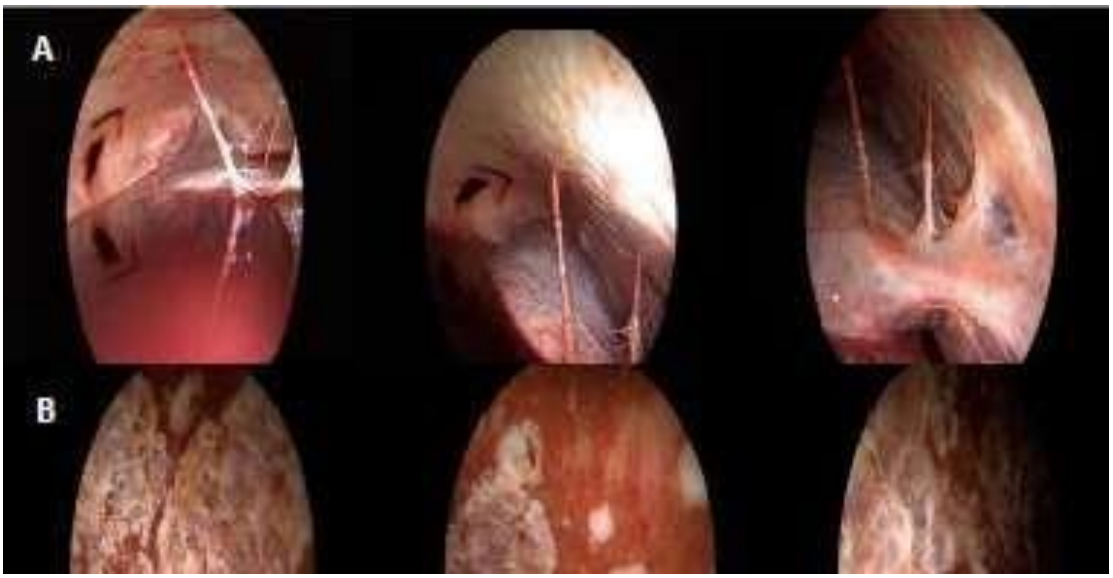

Figure 13: Macroscopic appearance during thoracoscopic surgery.

(Department of Thoracic Surgery, HMMI, Meknes)
Macroscopic appearance during video-assisted surgical thoracoscopy showing pleural nodules and pleural plaques.
A: pleural metastasis of a moderately differentiated adenocarcinoma of digestive origin.
B: pleural pleural of a poorly differentiated adenocarcinoma of pulmonary origin.
C: pleural pleural of a adenocarcinoma of pulmonary origin.

2. Macroscopy

Of the 40 pleural punctures performed, the fluid was serohematic in 2 cases (5%), hematic in 13 cases (32.5%) and citrine yellow in 25 cases (62.5%).

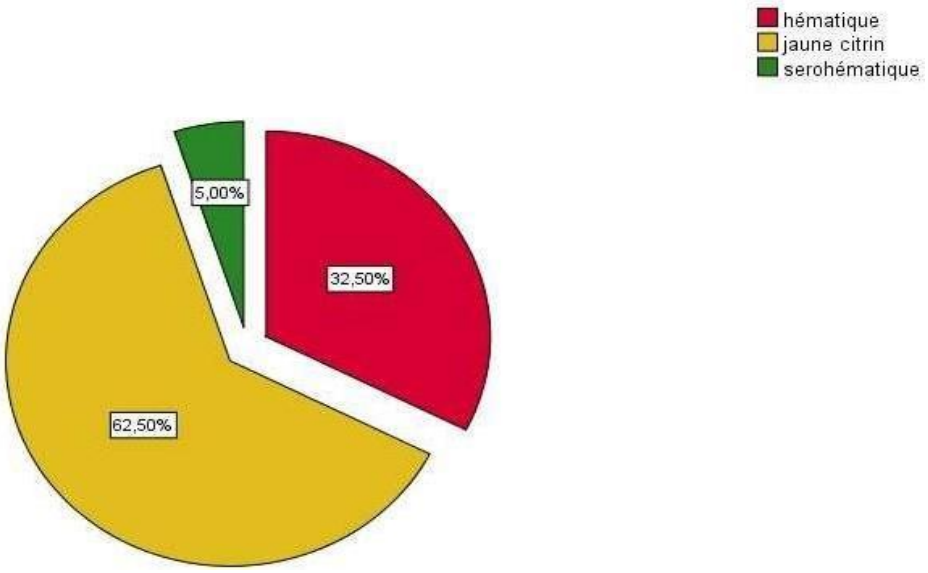

Figure 14: Distribution of pleurisy according to the appearance of the pleural fluid.

3. Microscopy

a. Cytology

- Lymphocytic predominance in 60% of cases
- Cancerous cells in 2 cases (4%)

b. Histology

The anatomopathological results of pleural biopsies are broken down as follows.

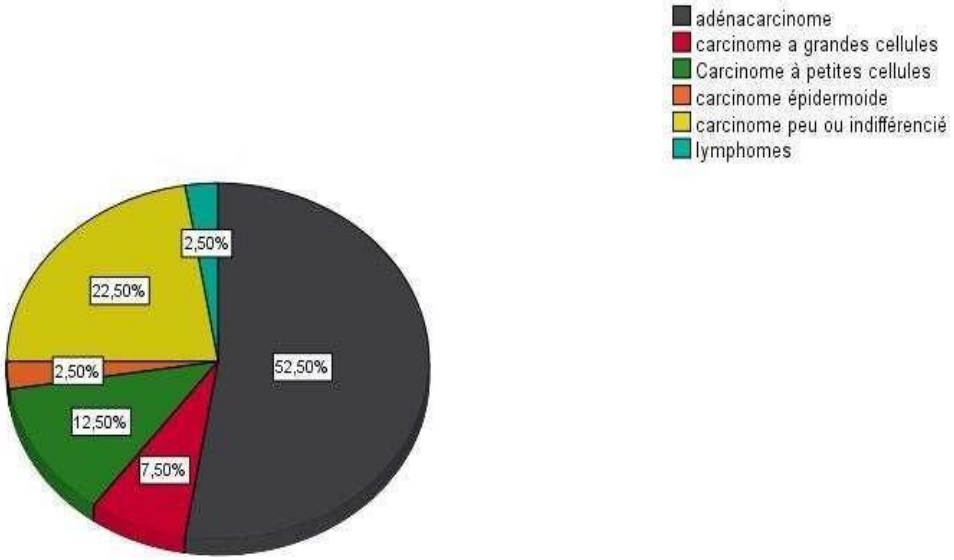

Figure 15: Histology of metastatic malignant pleurisy.

V. ETIOLOGY

The most frequent primary tumour in our series was lung cancer in 22 cases (55%), followed by breast cancer in 8 cases (20%) and gastric cancer in 3 cases (7.5%). Prostate cancer represented 05% of the causes of malignant pleurisy, whereas other cancers were found in only 1 patient (2.5%).

Lung	22	55.0
Breast	8	20.0
Gastric	3	7.5
Prostate	2	5.0
Oesophagus	1	2.5
Pancreas	1	2.5
Bile ducts	1	2.5
Ovary	1	2.5
Liver	1	2.5
Total	40	100.0

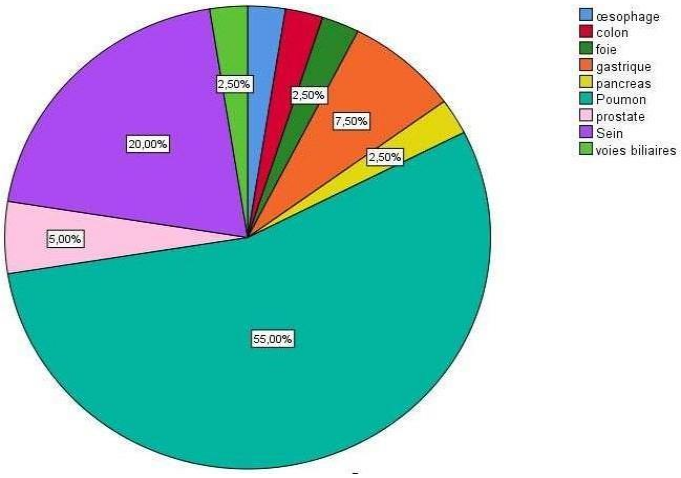

Figure 16: Distribution of pleurisy according to aetiology.

VI. TREATMENT

1. Local treatment

Evacuation of the pleural cavity and analgesic treatment were indicated in all cases. Iterative pleural punctures were performed in 14 patients (35% of cases).

Treatment by pleural talcation with a spray of two vials of talc was carried out in more than half the patients (30 patients or 75%).

A tunnelled pleural drain was performed in 3 patients (7.5%).

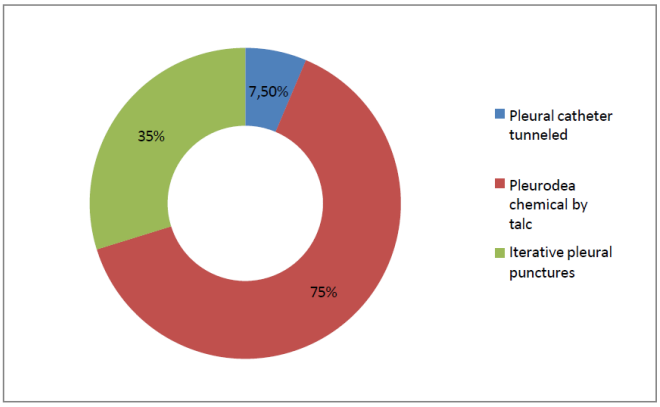

Figure 17: Distribution of patients by type of treatment.

Iconography illustrating the different parameters used in the surgical treatment of recurrent neoplastic pleurisy

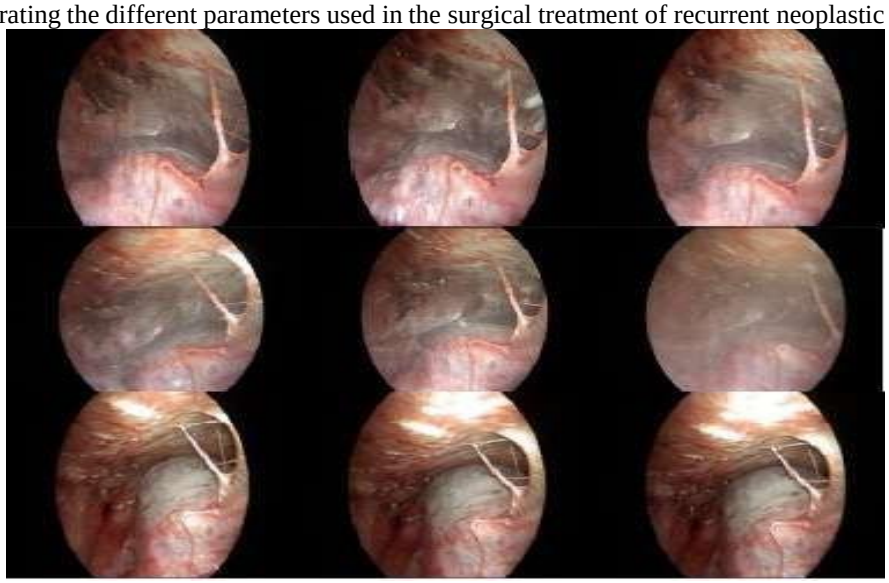

Figure 18: Chemical pleurodesis by sprinkling talc under thoracoscopy.

(Department of Thoracic Surgery, HMMI, Meknes).

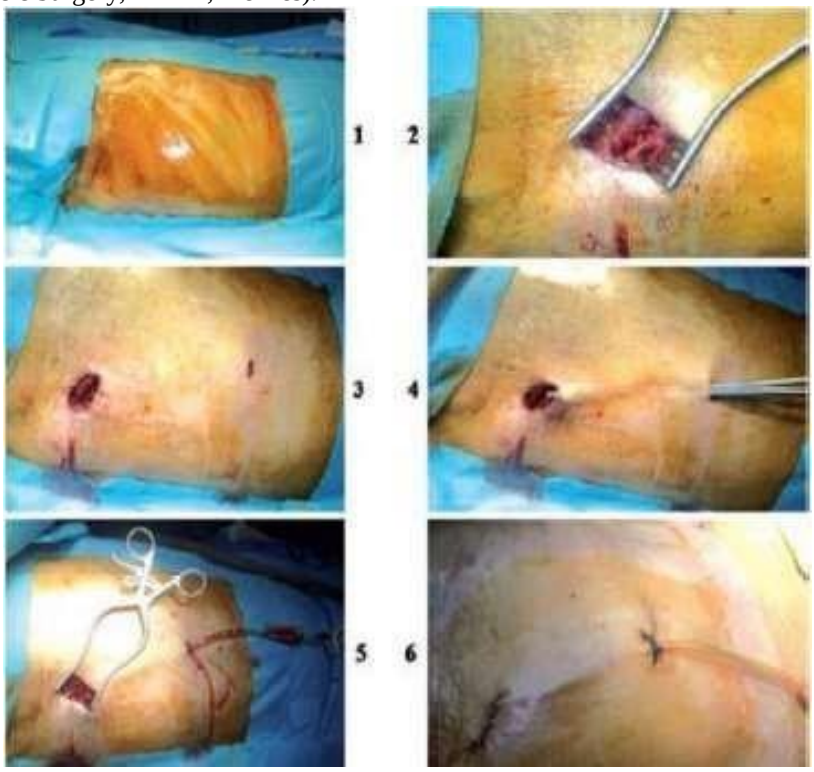

Figure 19: The DPT installation procedure.

- Exposure of the operating field.
- After local anaesthesia and a first skin incision, the soft tissues are dissected and spread to facilitate the intercostal approach.
- Make the second incision below.
- Use a long dissector directed upwards to tunnel the drain subcutaneously.
- Aspect of tunnelled drainage, and fixation in the musculoaponeurotic plane above.
- Final appearance after skin closure and connection to the suction system.

1. Treatment of primary cancer

In our series, chemotherapy or hormone therapy was initiated in 40 patients (100%).

VII. OVERALL SURVIVAL

Overall survival was 6.6 months on average.

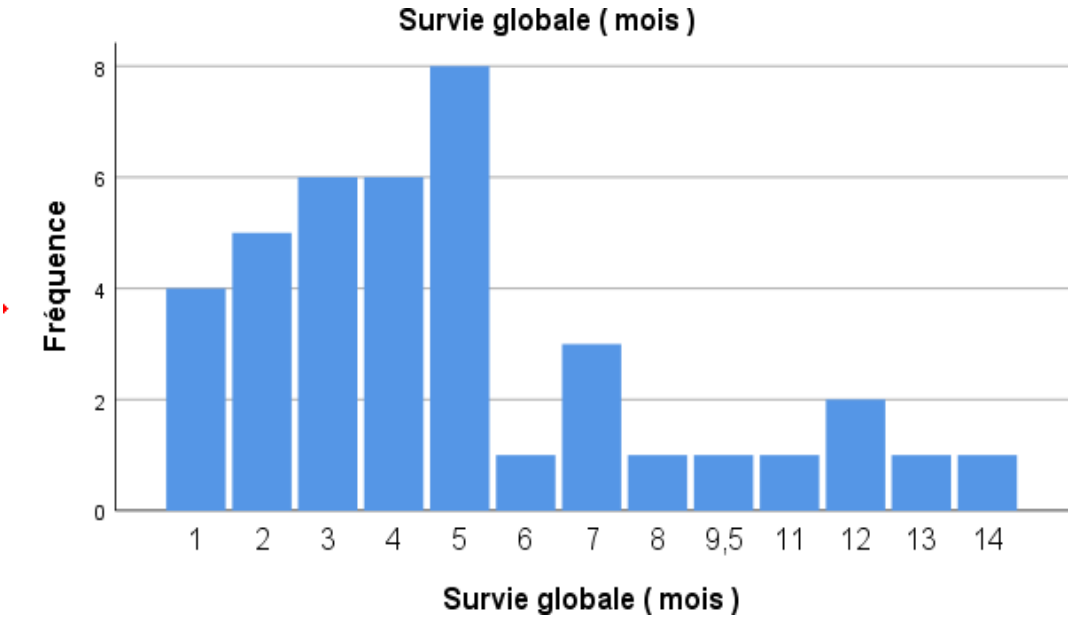

Figure 20: Overall survival for all aetiologies combined.

DISCUSSION

I. EPIDEMIOLOGY

1. Age

We found that patients aged between 50 and 70 were more likely to be affected. The average age of our patients was 62.75 years, with extremes of 50 and 84 years. Our statistics are in line with those found in Europe (France (67 years)[10], Germany (66 years)[11] and Asia (China (65.3 years)[16] and differ from those found in Africa (Morocco Atoini[12] (59.18 years) and chu Ibn Rochd (59 years)[13], Algeria (56 years)[14], Tunisia (58 years).[15]

Table 4: Comparison of the age of our series with that of the other series.

Authors	Country	Duration study	Number of cases	Average age per years
Atoini[12]	Morocco	2011-2017	50	59.18
CHEN[16]	China	1992-2013	1061	65,3
KOLSCHMAN[11]	Germany	1999-2001	102	66
NY[10]	France	2000-2003	95	67
BENJLLOU	Morocco	2003-2014	299	59
MOUMENI[14]	Algeria	2004-2014	200	56
AOUADI[15]	Tunisia	2009-2016	100	58
OUR SERIES	Morocco	2017-2019	40	62

2. Gender

In our series, men are more affected than women (sex ratio M/F is equal to 7), i.e. a rate of 87.5%. This male predominance is found in the Chen study[16], which found 57.5% with a sex ratio of 1.35, Kolshman[11], which found 55.9% with a sex ratio of 1.26, Benjelloun[13], which found 58.5% with a sex ratio of 1.46 and Moumeni[14], which found 63.5% with a sex ratio of 1.73. Conversely, ATOINI[12] who found 42% with a sex ratio of 0.72, Ny[10] who found 52.6% with a sex ratio of 0.90 and Aouadi[15] with a rate of 64% all found a female predominance.

This predominance of women can be explained by the prevalence of breast and genital cancers.

Table 5: Comparison of the gender distribution of our series with the other series.

autres séries

auteurs	pays	Durée d'étude	Nombre de cas	Sexe		
				M	F	SEXE RATIO
ATOINI[18]	MAROC	2011-2017	50	42	58	0.72
CHEN [20]	CHINE	1992-2013	1061	57,5	42,5	1,35
NY [17]	FRANCE	2000-2003	95	47,4	52,6	0,9
BENJELLOUN [21]	MAROC	2003-2014	299	58,5	41,5	1,46
MOUMENI [22]	ALGERIE	2004-2014	200	63,5	36,5	1,73
AOUADI [23]	TUNESIE	2009-2016	100	36	64	0,56
KOLSHMAN [19]	ALLEMAGNE	1999-2001	102	55,9	44,1	1,26
NOTRE SERIE	MAROC	2017-2019	40	35	5	7

II. CLINICAL

1. A history of pathological

Smoking was noted in 30 patients in our series (75%), whereas Ouardi (Mohamed VI University Hospital, Marrakech) noted it in 31 patients (48.4%), Benjelloun[17] (Ibn Rochd University Hospital, Casablanca) in 41.6%, t Harieche[18] in 35.4% and 30% in ATOINI.[12]

A history of neoplasia was found in 40 patients in our series (100%) and in 50% of cases in the ATOINI series[12], 40% of cases in the Aouadi series[15], (45.3%) in the Adambounou series.[20]

Table 6: Comparison of the background of our series with that of other series.

Authors	Country	Duration study	Number of cases	Tobacco	Neoplasia
ATOINI[12]	MOROCCO	2011-2017	50	30%	50%
Adama Bouno[27]	Togo	2007	117	-	45,3%
Aouadi [15]	Tunisia	2001-2016	100	-	40%
Ouardi [17]	Morocco	2010	64	48,4%	7,8%
Benjell oune[18]	Morocco	2012-2013	48	41,6%	4,7%
Hariec he[19]	Algeria	2013	62	35,4%	22,5%
Our serie s	Morocco	2017-2020	40	75%	100%

2. Average consultation time

In our series, the average duration of consultation was (2.1 months), which is comparable to that found by ATOINI[12] (2.2 months), Adambounou[20] (2.1 months), Moumeni[14] (2 months) and shorter than that found by Beillevaire14 (7.8 months).

This delay in consultation is thought to be due to patients neglecting the various symptoms at the outset.

Table 7: Average consultation time according to authors.

Authors	Country	Average consultation time
ATOINI[12]	MOROCCO	2 ,2 months
Beillevaire[21]	France	7.8 months
Moumeni[14]	Algeria	2 months
Adam banou[20]	Togo	2.1 months
Our series	Morocco	2.1 months

3. General Condition

Changes general condition and weight loss are common, especially in patients at an advanced stage of the disease. General condition is assessed using the WHO score, which comprises 4 stages.

- 0= Normal activity with no restrictions.
- 1= Patient limited for important physical activities but ambulant and able to carry out work.
- 2= Patient unable to work, bedridden < 50% of the time, capable of self-care.
- 3= Patient bedridden > 50% of the time, able to take care of themselves
- 4= Patient unable to look after themselves.

This score was not specified in our study due to its retrospective nature. The assessment was subjective. The general condition of our patients was impaired in 70% of cases, a figure comparable to that found by ThiBich[22], which was 69.3%. ATOINI[12] and Chernow[23] found lower figures (54%), (32%).

Table 8: Comparison of general condition in our series with other series.

	ATOINI[12]	Chernow[23]	Thi-Bich[22]	Our series
Alteration from general condition	54%	32%	69,3%	70%

It would appear that this poor general condition is more a function of the tumour's progressive nature, which goes hand in hand with the duration of the pleurisy.

In our study, the abundance of pleurisy also appears to be a negative factor for the patient's clinical condition.

4. Signs functional

Neoplastic pleurisy should be suspected and investigated in any patient over 60 who presents with insidious dyspnoea associated with uni-or bilateral pleurisy. The same applies to patients known neoplasia who develop pleural effusion.

Symptoms associated with neoplastic pleurisy are usually evident from the volume of fluid effusion, which often exceeds 500ml.[24]

Dyspnoea is the most common symptom of EPM, occurring in over 50% of patients.[24] The pathogenesis of pleurisy-induced dyspnoea is not clearly defined but is thought to be the result of multiple factors including reduced parietal compliance, contralateral mediastinal shift, unilateral lung volume reduction and reflex stimulation with parietal and pulmonary onset.[25]

Excessive chest pain is often found, particularly in the presence of mesothelioma[26; 27], and a dry cough may also be an accompanying symptom.[24]

In our series, all patients were symptomatic. Dyspnoea was the main symptom (87.5%), followed by chest pain (47.5%) and dry cough (10%). This distribution differs from one author to another. It is comparable to that found by ATOINI[12] and Thi-bich[22], whereas Chernow[23] and Kolschman[11] emphasise the predominance of cough in

second place after dyspnoea.

Table 9: Frequency of functional signs in our series and in the literature.

Signes fonctionnels	ATOINI[18]	Chernow[30]	Kolcheman[19]	Thi-bich[29]	Notre série
Dyspnée	78%	57%	86,3%	90%	87,5%
Douleur thoracique	58%	26%	22,5%	86%	47,5%
Toux sèche	44%	43%	23,5%	70%	10%

In our series, we found a clear relationship between dyspnoea and pleurisy. This functional sign is correlated with the volume of the effusion: 86% of patients with pleurisy of great abundance had dyspnoea, compared with 69% of those with an effusion of moderate abundance.

5. Examination

Clinical examination begins with inspection (intensity of dyspnoea, mottling, rash). In the case of abundant unilateral effusion, the thorax bulges, with a reduction in thoracic expansion on the same side; signs of poor respiratory and haemodynamic tolerance are immediately sought.

Palpation may reveal the abolition of vocal vibrations on the side of the effusion. The percussion is of great interest, bringing out a frank mattness.

Auscultation reveals suggestive signs: abolition of the vesicular murmur, presence of a pleural murmur which is classically soft and expiratory, perceived at the upper limit of the effusion.[28]

The clinical picture in our patients is similar to that seen elsewhere, with cough, dyspnoea, chest pain, auscultatory asymmetry and deterioration in general condition.

III. RADIOLOGY

1. Chest X-ray

A chest X-ray is a simple examination that can be used to confirm the diagnosis pleural effusion. The abundant or massive nature of pleurisy increases the likelihood of its neoplastic origin. Some studies report a neoplastic origin in 67% of massive effusions.[29]

The effusion may be minimal, filling only the diaphragmatic pouch.

It may be of moderate size: limited to the third or lower half of the hemithorax, with the diaphragmatic dome obliterated; its upper limit is blurred and degraded, and may form the classic Damoiseau line, concave above and medially.

It can also be very abundant: reaching the clavicle, occupying the entire hemithorax (giving the image of an opaque hemithorax), with deviation of the mediastinum on the opposite side and widening of the intercostal spaces.

At a later stage, when the underlying lung collapses, these signs disappear and the differential diagnosis with atelectasis may be difficult.[28]

The pleurisy may be encysted, giving the image of a pleural opacity that cannot be mobilised on positioned views.[30] In our series, chest X-rays were routinely taken on admission.

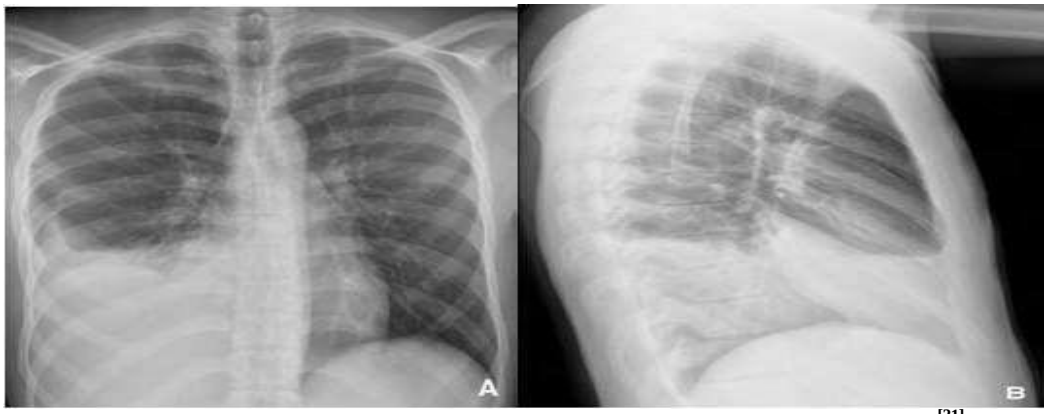

Figure 21: Radiograph of right pleural effusion. A--Front view. B-side view.[31]

In our study, the majority of pleurisies (52%) were bilateral. This result differs from that reported other authors.[12,22, 32,33]

According to our results, pleurisy of low abundance predominates (50%), whereas ATOINI[12] and Thi-Bich[22] emphasise the predominance of pleurisy of high abundance.

Table 10: Comparison of the distribution according to abundance and side of the effusion in our series compared with other series.

	ATOINI[12]	Safeeddine[18]	Thi-Bich[22]	Sahbaoui[32]	Our series
Right pleurisy	52%	64%	56,3%	41,8%	25%
Left pleurisy	38%	36%	28,1%	23,9%	22,5%
Pleuresis Bilateral	10%	0%	15,6%	16,2%	52,5%
Grande abundance	56%	-	43,8%	-	25%
Average abundance	38%	-	34,4%	-	25%
Low abundance	6%	-	6,2%	-	50%

2. Ultrasound Thoracic

Pleural ultrasound can be used to confirm the diagnosis of pleural effusion, quantify it and locate it before puncture.[33]

Non-invasive and non-irradiating, this examination is easily reproducible and more sensitive than a chest X-ray for detecting small pleural effusions.

On ultrasound, the effusion appears anechoic. In the supine or sitting position, the pleural effusion collects in the posterior costodiaphragmatic cul-de-sac. On a subcutaneous slice, the pleural effusion is visible across the entire width of the diaphragmatic dome.

The real contribution of ultrasound lies in the study of complex effusions. Theoretically, ultrasound is capable of distinguishing clear, anechoic fluid effusions from inflammatory effusions, where fibrinous or haematic deposits are present.

A fluid with thickening of the pleura is in favour of an exudate.[34] whereas an anechogenic fluid is more likely to be a transudate.[35]

Ultrasound can be used to monitor the development of the effusion and, above all, to highlight the presence of partitions within the effusion in the form of fine echogenic trabeculae that are mobile on breathing.

It can therefore be used to guide the thoracoscopic instrumental procedure and to determine the ideal location for postoperative drains.[36]

It provides key elements for semiology, making it possible to dissociate pleural opacity and pulmonary opacity, and to characterise the effusion (transsonic, echogenic, with false membranes; already organised but not partitioned.

It is a valuable aid to management in

- Guiding the puncture to areas where the effusion is more fluid.
- Selecting the effusions to be drained and helping with the choice of drainage method.
- Referring to surgical treatment in the event of partitioning.[37]

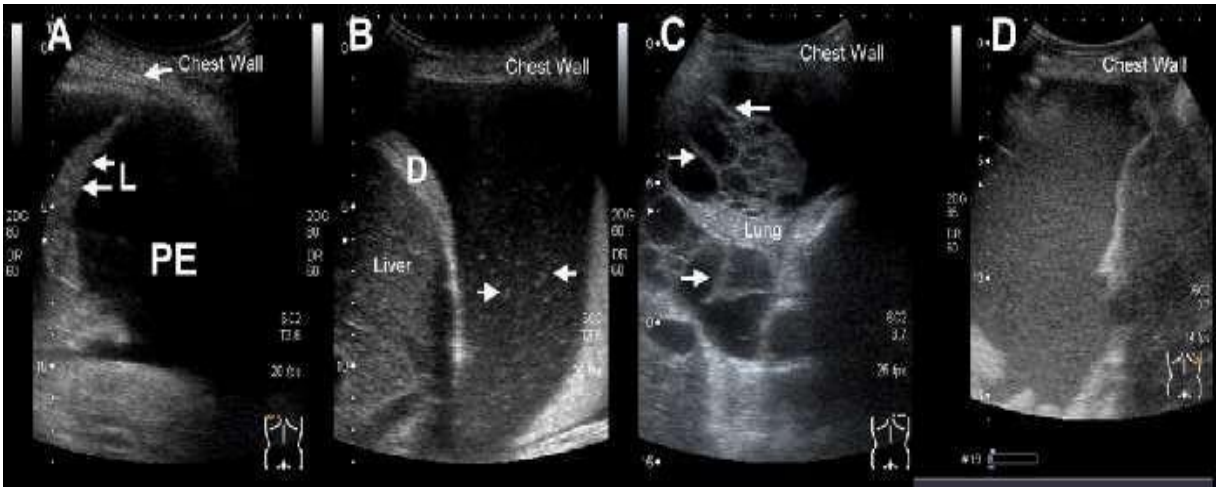

Figure 22: Classification of aspects of pleural effusion on ultrasound: A anechogenic, B non-partitioned complex, C partitioned complex, D homogeneous echogenic.[31]

In our series, thoracic ultrasound was performed in 40 patients (100%) and revealed pleural thickening in 16 cases, minimal free pleurisy in 3 cases, abundant free pleurisy in 23 cases, moderately abundant free pleurisy in 14 cases and pericardial effusion associated with pleurisy in one case.

3. Computed tomography thoracic

Chest CT is now the key examination in the management of pleural effusions.[38]

On computed tomography (CT), the pleural fluid takes on a meniscoid appearance occupying the posterior part of the large cavity when the patient is examined supine.

When the abundance of the effusion increases, the fluid spreads to all the other natural spaces of the pleura. CT detailed images of the pleural cavity, enabling differentiation between free or collected large cavity effusion and pleural thickening.[39,40]

It provides an accurate assessment of the volume of the effusion, but not its nature, the thickening of the pleural layers, the location of pleural pockets in the case of a partitioned effusion, the state of the underlying parenchyma, and the presence of any mediastinal adenopathy or distant metastases. It is imperative in the event of a protracted course or failure of puncture or drainage.[28]

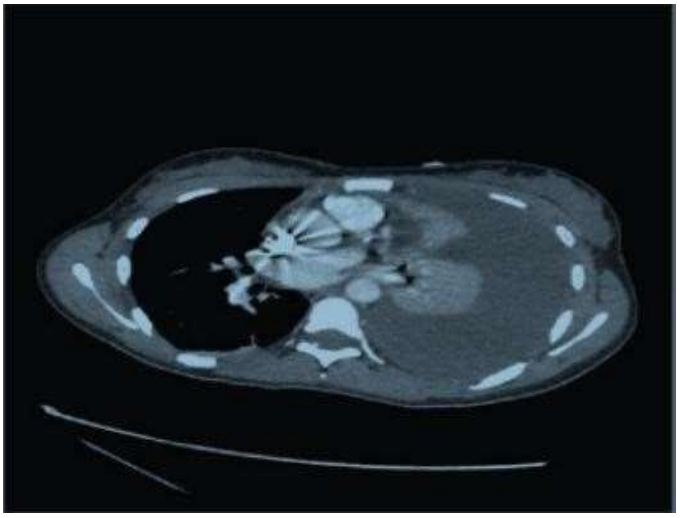

Figure 23: Chest CT scan: abundant left pleural effusion with passive atelectasis of the lung and compression of the mediastinum.[38]

In our series, thoracic CT scans were performed in 40 cases, i.e. 100% of patients, and revealed associated lesions: nodules, infiltrates or pulmonary masses in 55% of cases, mediastinal adenopathies in 40% of cases, and pericardial effusion in 2.5% of cases. These data are similar to those reported in the series by ATOINI[12] and Donovan et al.[41]

Table 11: Frequency of scannographic abnormalities associated with malignant pleurisy in other series.

	ATOINI[12]	Donovan and AL[41]	Our series
Invasive nodule or mass suspicious lung	45%	53%	55%
Mediastinal ADP	18%	43%	40%
Blood effusion pericardial	4 ,5%	3%	2,5%

IV. DIAGNOSIS OF MALIGNANCY

The diagnosis of carcinomatous pleurisy is made when malignant cells are present in the pleural fluid or in a pleural tissue sample.

The cost-effectiveness of diagnostic tests for EPM increases with the spread of neoplastic disease in the pleural cavity.[42]

1. Puncture Pleural

Thoracentesis with pleural cytology analysis remains the least invasive investigation for the diagnosis of EPM.

a. Technique[43]

The patient was informed of the technique and reassured after a local anaesthetic (intradermal injection of 0.5 cc followed by a tracer injection of 3 cc of 1% xylocaine) at the puncture site chosen on the basis of clinical (area of full dullness) and radiological data.

Using a special pleural trocar or, more often than not, a

simple IM needle (in obese patients, a long IM or even a lumbar puncture needle may be necessary).

After disinfecting the skin, washing the hands and using sterile gloves, the puncture is carried out in the middle and/or two intercostal spaces below the tip of the scapula, with the needle empty, skimming the upper edge of the lower rib.

The vascular and nervous elements located under the ribs must be avoided.

When the aspiration brings back liquid, the pleural cavity is reached and the needle is stopped.

Fluid sent to various laboratories: haematology (cell count and formula), bacteriology, biochemistry (determination of proteins, glucose, LDH and pH), anatomopathology (cytological study).

This exploratory or evacuating pleural puncture is easy in the case of large effusions, but more delicate in the case of small, encysted effusions, where it requires prior identification of the collection using medical imaging tests (X-ray, CT scan, ultrasound).

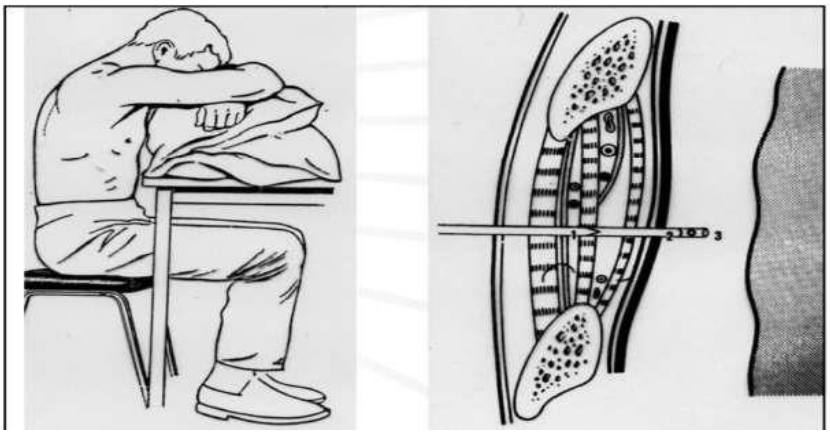

Figure 24: Patient position for pleural puncture: Round back.

There are no absolute contraindications to this procedure. The relative contraindications are minimal effusion, coagulation disorders or anticoagulant treatment, and the existence of mechanical ventilation.[44]

Possible complications include pain at the puncture site with poor tolerance (vagal malaise), pneumothorax, haemothorax (puncture of an intercostal artery), infection, or tumour spread at the puncture site. More rarely, punctures of the liver or spleen may occur.[45]

a. Macroscopy

In our study, most common appearance was citrine yellow (62.5%) followed by hematic (32.5%). This result is comparable with that reported by Adambounou[20] (42%) while ATOINI[12] emphasises the predominance of the serohaematic type (52%) followed by the hematic aspect (34%).

Table 12: Macroscopic aspects of pleural fluid according to certain series.

Auteurs	Nombre de cas	pays	Durée d'étude	Aspect du liquide		
				Sérohématique	hématique	Jaune citrin
ATOINI[18]	50	MAROC	2011–2017	52%	34%	14%
Adambounou[27]	117	Togo	2007–2016	29%	29%	42%
Notre série	40	Maroc	2017–2019	5%	32,5%	62,5%

Haemorrhagic pleurisy, a pinkish or red uniformly tinted fluid that does not coagulate, is suggestive of neoplastic pleurisy.[46]

a. Pleural Cytology

Cytological analysis is an important element of orientation with the notion of a high pleural lymphocytosis in favour of carcinomatous pleurisy or tuberculosis, but this is not specific. The cellular formula can be established and malignant cells found. Finally, mesothelial cells are frequently found. These must be studied in particular so as not to be confused with malignant cells.[47]

The presence of tumour cells confirms the neoplastic nature of the pleural effusion, and is sufficient only if the patient has a known cancer. In other cases, the diagnosis must be confirmed by pleural biopsies.

With the improvement in cytological techniques, the cost-effectiveness of thoracocentesis in diagnosing the malignancy of pleurisy varies between 60 and 90% and depends on the degree of pleural invasion and the histology of the primary tumour.[48]

Our study revealed a lymphocytic predominance in 60% of cases, and cancerous cells in 2 cases (4%). In the other cases, the results were not mentioned in the medical records (data missing).

2. Blind pleural biopsy[49]

a. Technical details

The patients were positioned comfortably in a sitting position, with their backs bent and not fasting. We performed a wide-ranging skin disinfection, followed by an intradermal local anaesthetic over 1cm in diameter (1ml of 2% xylocaine), followed by a 4ml tracer injection subcutaneously until the puncture syringe penetrated the pleura, with aspiration of the liquid.

The biopsy is carried out when the skin is completely dry, between the sixth, seventh, eighth or ninth intercostal space, passing above the upper edge of the lower rib of the space after having incised the skin horizontally over 5mm using a fine scalpel blade. The biopsy needle (Castelain) is inserted at the point of the incision until a protrusion is felt, corresponding to the passage of the parietal pleura. By sliding, the tip of the needle and its mandrel are tilted downwards or laterally to guillotine a fragment of parietal pleura using formalin as a fixative. The needle is reintroduced using the same protocol for a second or third biopsy at different sites, or to evacuate pleural fluid. At least two fragments are taken.

After the procedure, a careful massage is performed immediately after the needle exit to dissociate the planes, and then a stitch is applied.

b. Diagnostic Performance

Blind percutaneous pleural biopsy using an Abrams or castelain needle has a sensitivity of between 40 and 70% in the identification of malignant pleural disease.

This depends on the extent of the tumour in the parietal pleura, the number and quality of the biopsies and the experience of the operator.[50, 51]

V. VIDEO-THORACOSCOPY

Medical thoracoscopy or video-assisted thoracic surgery (VATS) remains the "Gold Standard" for exploring pleural pathologies, with sensitivities close to 100% in the hands of experienced operators, even at an early stage of pleural metastatic dissemination.

The classic causes of false negatives with this investigative technique are: inexperience on the part of the operator, incomplete exploration of the entire pleural cavity due to pleural bridges and adhesions, or biopsy samples that are unrepresentative or insufficient.[52, 53]

1. Preparation-Anaesthesia

Thoracoscopy requires hospitalisation, and all types of anaesthesia are possible, based on the experience of the teams, the local technical facilities, the indication for the examination, and the patient's choice after being informed of the quality of the examination.[54] In general, general anaesthesia is used, with tracheal intubation usually selective.

In patients at high risk or in poor general condition, or in cases of cardio-respiratory insufficiency contraindicating general anaesthesia, sedation or local anaesthesia is preferred.[55], performed on a low-risk patient whose pleural cavity is free of adhesions. It allows the patient to remain conscious for as long as reasonably possible and ensures rapid recovery.

These anaesthesia techniques require the collaboration of an anaesthetist with legal constraints: pre-anaesthetic consultation, monitoring of recovery in the endoscopy room or recovery room under the supervision of an anaesthetic nurse.

The examination is carried out fasting in the supine position, on the side opposite that to be investigated, which gives the surgeon very good exposure of the hilum.[56]

Settling in is an important stage, and care must be taken to protect the support points to avoid contact with a hard surface; a cushion is placed under the head to prevent stretching of the cervical roots, and a block is mounted under the thorax to free the shoulder; the lower arm is placed on a support at the height of the table with an angle not exceeding 90°, the other arm hangs forward where it is raised on another support to avoid elongation of the brachial plexus; the symmetry of the radial pulses must be checked to detect compression of an axillary artery;

the patient is supported by anterior and posterior supports, the lower leg is half-bent, a cushion is placed between the knees. The position of the intubation tube in the case of general anaesthesia must be checked once the patient has been settled, as there is a risk of the tube moving.[57]

The examination is carried out after local disinfection, shaving the hemithorax and axilla beforehand and applying sterile drapes. Both in the literature and in our series, thoracoscopy was performed under general anaesthetic in the majority of cases.

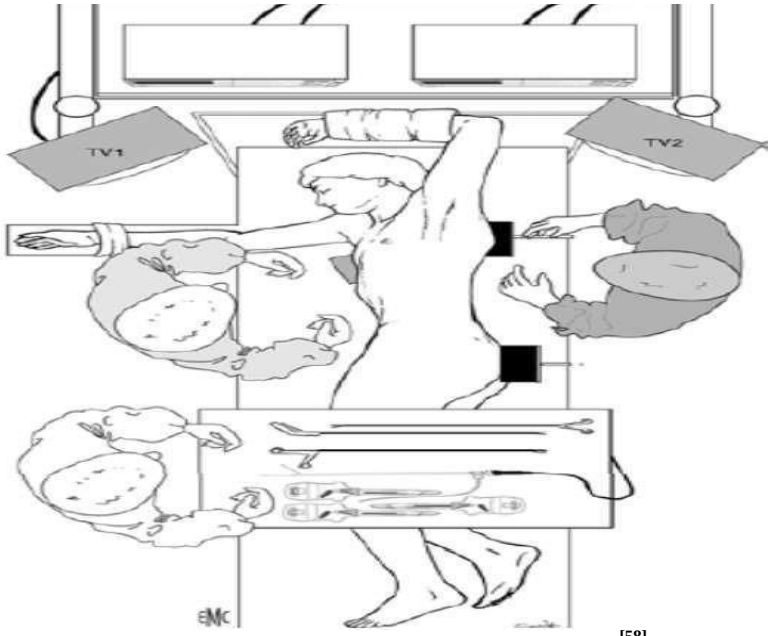

Figure 25: Position of screens and operators.[58]

2. Biopsy Pleural

Thoracoscopic pleural biopsies are the gold standard, with a diagnostic sensitivity of 100%.

The rare failures of this technique are linked to symphysis, which hinders complete exploration of the pleural cavity. Repeated pleural punctures and blind pleural biopsies can lead to pleural adhesions.

Metastases may be observed in the parietal or visceral layer of the pleura but generally predominate in the visceral pleura at the beginning. They may take on various macroscopic appearances: nodules, tumour buds varying size, localised or diffuse, smooth or mamelinated inflammatory pleural thickening.[59] Biopsies must be systematic and multiple, whatever the appearance, involving the parietal pleura, the diaphragmatic pleura and the visceral pleura if it is dotted with macro-nodules, as there is a risk of alveolar leakage.

The rapid indication of thoracoscopy for diagnostic purposes is therefore often the most prudent choice to make in a patient presenting with an exudative pleural effusion, without any criteria for an infectious origin, and whose cytological examination is negative.[60]

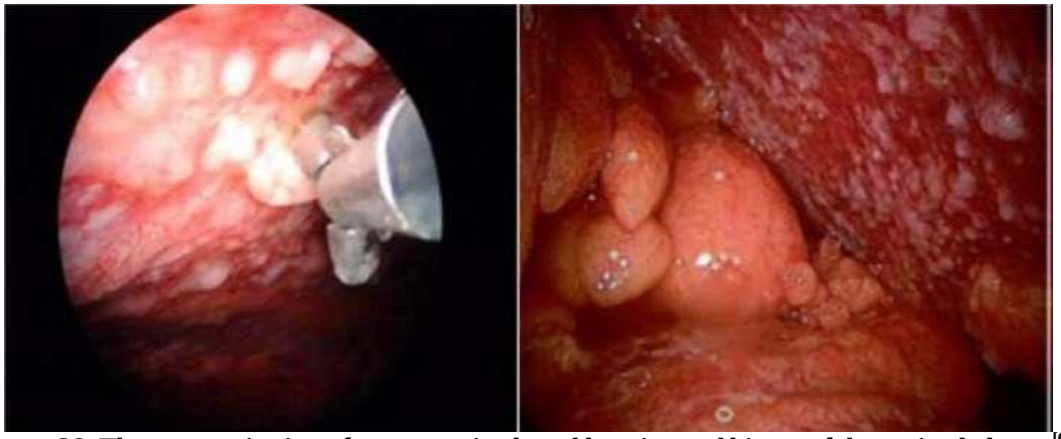

Figure 26: Thoracoscopic view of a metastatic pleural location and biopsy of the parietal pleura.[61]

Table 13: Means of confirming the aetiological diagnosis of neoplastic pleurisy according to the literature.

Auteurs	Nombre de cas	pays	Durée d'étude	Cytologique	Biopsie à l'aveugle	Biopsie sous thoracoscopie
ATOINI[18]	50	MAROC	2011–2017	4%	–	76%
Sehbaoui[41]	117	Maroc	206–2008	55%	40 ,1%	4 ,2%
Quardi[23]	64	Maroc	2010–2014	14%	81%	5%
Harieche[26]	62	Algérie	2013–2015	34%	63%	5%
Notre série	40	Maroc	2017–2020	4%	25%	75%

VI. ETIOLOGY

Any malignant tumour proliferation, whether carcinoma, lymphoma, sarcoma, melanoma, germ cell tumour or mesothelium, can metastasise to the pleura.

The origin and frequency of cancers causing malignant pleurisy vary from study to study. Bronchial and breast cancers and lymphomas are the main causes of malignant pleural effusion, accounting for at least 65% of metastatic effusions.[62]

The frequency of mesothelioma varies greatly from region to region, due to the variation in areas of occupational exposure to asbestos.

Bronchial cancer is the most common cause of malignant effusion. Breast cancer is the second most common cause of malignant pleurisy. In some studies, however, its frequency exceeds that of bronchial cancer.

In our study, bronchial cancer was the leading cause of malignant pleural effusion (55%). It was followed by breast cancer (20%).

This distribution is similar to that described by Bielsa[63] with a rate of (41%), Garrouch[64] (42%) and Harieche[19] (31%).

Conversely, ATOINI[12], Aouadi[15], Schniewind[83] and Schulze[84] reported superiority for breast cancers. The main other neoplastic diseases, in descending order, are gastric cancer (7.5%), prostate cancer (5%), followed by ovarian cancer (2.5%), pancreatic cancer (2.5%), biliary cancer (2.5%) and liver cancer (2.5%). In our study, no sarcoma appeared during this period in the form of malignant pleurisy, or even any ENT cancer, lymphoma or mesothelioma.

Table 14: Comparison of aetiologies of pleurisy.

	ATOINI	Bielsa	Schulze	Garrouch	Schnie wind	Harieche	Aouadi	NOTRE Série
POUMON	22%	41%	17%	42%	22%	34%	25%	55%
SEIN	24%	22%	48%	21%	41,5%	13%	40%	20%
Digestif	4%	6%	4%	–	8,1%	3%	–	9%
Mésothéliome	6%	–	–	–	–	–	2%	–

VII. TREATMENT

A. GOALS

- Evacuate the effusion to relieve symptoms (reduce dyspnoea)
- Prevent recidivism (reduce the frequency of hospitalisations)
- Return the lung to the wall

B. RESOURCES

a. Local treatment

i. Iterative pleural punctures[65]

All EPM patients should undergo evacuation thoracocentesis in order to determine its effect on dyspnoea and to assess the speed and degree of recurrence of the effusion.

It is recommended to evacuate only 1 to 1.5 litres of fluid per puncture in order to avoid re-expansion pulmonary oedema (vacuo oedema) or vacuo shock.

This technique does not prevent the re-accumulation of fluid in the pleural cavity, which means that the procedure must be repeated at a frequency that depends on the rate of re-accumulation.

This approach does not achieve symphysis. It is only used in patients who refuse other methods or in patients at a very advanced stage with a prognosis measured in days or weeks.

This is a purely palliative option that cannot be used for long-term control.

In our study, iterative pleural punctures were performed in 14 patients (34%) with recurrent MPE, advanced disease, poor general performance index and short life expectancy.

ii. Chemical pleurodesis[66]

The aim of pleurodesis is to use a chemical product to produce multiple solid adhesions in the pleural cavity through an inflammatory reaction between the parietal and visceral pleura in order to prevent recurrence of a pleural effusion.

Pleural symphysis is only considered if 3 conditions are met.

- The effusion recurs after evacuation.
- Punctures or drainage improve the patient's condition
- The lung re-expands after evacuation.

ii.1. Video-assisted thoracoscopy

❖ Agents symphysants

Several general reviews and a few randomised studies have critically examined symphyseal agents. Biological products and biological adhesives have given variable results, and among the other products used, three stand out: talc, tetracycline and bleomycin.[65]

We are not in favour of tetracycline for the following reasons: the drainage time is fairly long (5 to 6 days or even longer), the sclerosing action is dose-dependent, which often means that the tetracycline has to be re-injected, thereby increasing the drainage time. The local pain induced by tetracycline is severe and requires considerable analgesia. Last but not least, the duration of symphysis is uncertain. As for bleomycin, its main drawbacks are its high cost and the risk of toxicity through systemic absorption.

We therefore feel that pleural talcation is the most effective technique.

Pleural symphysis is then performed. After complete evacuation of the liquid, gentle spraying with sterile talc, without mineral fibres, under visual control of the entire pleural surface, allows symphysis to be achieved in more than 90% of cases when complete re-expansion of the lung is obtained.[67,68]

❖ **RESULTS**

➢ Immediate results

The immediate positive response rate in our study was 93%. These results are similar to those found by ATOINI[12] in MOROCCO (96% response rate), Boniface in France (93% response rate)[69], Ladjimi in Algeria (78% response rate)[70], Viallat in Marseille (90.2% response rate)[71] and Ngo Quy Chaud in Vietnam (96.6% response rate).[72] Whereas Ny et al[10] in France found lower rate of positive responses (67% response).

Table 15: Rate of immediate positive responses.

Auteurs	ATOINI	Boniface	Viallat	Ldjimi	Ny	Ngo Quy Chaud	Notre série
Réponse positive immédiate	96%	93%	90,2%	78,2	67%	96,6%	93%

➢ Long-term results

This response to thoracoscopic talcation is maintained in most patients, with positive long-term results of 90%. These results are similar to those found by ATOINI[12], (96% of definitive responses), those of Boniface (80% of definitive responses)[69], those of Ny in France (81% response)[10], those of kolschman in Germany (82.6% response)[11], and those of Barbetakis in Australia (85% response).[73]

Table 16: Long-term positive response rate.

	ATOINI [18]	Boniface [92]	Kolschman[19]	Ny[17]	Barbetakis[96]	Notre série
Réponses positives	95%	80%	81%	82,6%	85%	90%

➢ Factors likely influence talc results

We Noted

A case of early failure in a patient with breast cancer, whose macroscopic appearance under thoracoscopy revealed an advanced tumour process located on the three pleura, parietal, visceral and diaphragmatic, and whose pleurisy had developed 04 months before talcation.

It would therefore seem that the failure of talcation is due to the size and extension of the pleural tumour, combined with the age of the effusion: voluminous buds can impede contact between the parietal and visceral pleural layers, which are prerequisites for symphysis.

However, some pleurisies which had been evolving for several months were successfully talcated. We would therefore tend to agree with Ladjimi[74] that the success or failure of talcation depends above all on the speed at which the neoplastic process evolves and spreads.

We find it difficult to judge the role of the nature of the primary cancer in the success of talcation, given the small number of certain aetiological groups.

❖ Average drainage time

In our study the average drainage time was 4.6 days, which is comparable to that found by ATOINI[12] (4.7 days), Viallat[71] (5.3 days), Garrouch[86] (04 days) and shorter than that found by Kolschman[11] (06 days), Barbetakis[73] (06 days).

Table 17: Comparison of average drainage time.

ATOINI	Viallat	Garrouch	Kolschmann	Barbetakis	Our
[12]	[94]	[56]	[19]	[73]	series
Average duration 4.7 days drainage	5,3 days	4 days	6 days	6 days	4,6 days

❖ Complications and morbidity

The variation in the incidence of ARDS after talcation between series also suggests the possible role of certain impurities in the preparation of the talc used. To further limit the occurrence of this complication, the authors recommend that pleurodesis should not be performed simultaneously on both sides.

The second complication, which is also serious and is due to rapid evacuation of the effusion, is re-expansion pulmonary oedema. This is often unilateral, but sometimes bilateral, and is difficult to distinguish from ARDS following talcation. The factors contributing to this are better known: the extent and duration of pulmonary collapse under the effusion, and the speed with which the lung re-expands, favoured by suction that is too strong or too rapid.

The other complications are mainly thermal ascension and pain, which is constant but less intense than when talc is applied to a pneumothorax, and can be observed when the talc is being sprayed and in the 24 hours following the procedure.

In our study, the main side effects were chest pain (73% of cases), and fever (37%), prolonged bullage in (7%), ARDS (3%).

These incidents progressed favourably with treatment, and only one case of death by ARDS was noted in a 59-year-old patient, whose disease was very advanced with bilateral metastatic pleurisy from lung carcinoma.

ii.2. By chest drain: talc slurry.[75,76]

An alternative to talc packing during thoracoscopy is instillation through the drain of talc suspension or talc slurry. A mixed solution of talc and isotonic saline (+/- lidocaine) is administered blindly through the chest tube.

The advantages of this technique are that it is performed under local anaesthetic, in the patient's bed.

Its disadvantages, however, are talc leakage when the chest tube is suctioned, non-uniform distribution of talc and accumulation of talc in declivity zones. Pleural symphysis is therefore incomplete and effectiveness is further reduced.

iii. The tunnelled pleural drain[77,78]

The principle is to leave a drain in place in the pleural cavity to allow repeated aspiration, particularly at home. The aim is evacuate pleural fluid iteratively, with as little strain as possible. In some cases, iterative suctioning can result in pleural symphysis.

The technique is performed on an outpatient basis, with a maximum hospital stay of 24 to 48 hours, and can be applied under local anaesthetic or light sedation in a dedicated room.

The procedure is performed under strict aseptic conditions, with the patient in a lateral decubitus or sitting position. An injection of xylocaine is performed on the median axillary line, in the area of dullness, to confirm the pleural location.

A metal guide is introduced into the pleural space, then a trocar is placed in the pleural space. The drain consists of a distal part which is placed in the pleura, a median part which is tunnelled under the skin and an external part fitted with a non-return valve.

The distal part of the drain is inserted into the trocar, from which the peelable parts are then removed.

The two skin incisions (upper corresponding to the pleural introduction and lower corresponding to the skin exit) are closed.

Aspirations are performed according to the rate of fluid renewal. Aspirations must always be performed under aseptic conditions, generally in a HAD (Hospitalisation A Domicile) setting ( ). Dressings are applied every 24 to 48 hours after betadine disinfection. A silicone foam interface is applied to the skin, the catheter is rolled up and covered with dry compresses, followed by an adhesive dressing. A watertight film is also applied to allow showering.

This system helps people to maintain their activities of daily living to the maximum. For repeated evacuations, we use suction bottles (with negative pressure), such as redon or specific dedicated bottles.

Training in the fitting and use of TPDs exists for medical and paramedical teams. Immediate complications include pneumothorax, bleeding and parietal haematoma at the insertion point. At a distance, and linked to the chronic presence of the catheter, infectious complications and tumour dissemination in the subcutaneous tunnel may occur. The catheter may also become blocked.

In our study, the tunnelled pleural drain was used in 2 patients (6%).

In medical indications leading to the installation of a TPD rather than a other technique, a contraindication to general anaesthesia or a general condition incompatible with surgery.

a. Treatment of primary cancer

Specific treatment can only be envisaged in a minority of patients: mainly those in good general condition with breast neoplasia, bronchial cancer or lymphoma, who can derive the most benefit, at least temporarily, from treatment with chemotherapy or hormone therapy.[79]

In the case of breast cancer[80]

Factors influencing the choice of treatment

- Tumour biology: hormone-sensitive or HER2+ tumours
- Age of patient
- Location of metastases: bone, visceral
- Need for a rapid response (e.gliver metastases, risk of spinal cord compression, etc.)

Hormone therapy

- 1st choice for hormone-sensitive (non-HER2) breast cancer
- Goal: tumour control to delay chemotherapy
- Advantages: acceptable toxicity, per os, significant efficacy
- Disadvantages: response time, toxicity 1/tamoxifen (Nolvadex®) 2/ aromatase inhibitor: letrozole (Femara®), anastrozole (Arimidex®), exemestane (Aromasin®) 3/ fulvestrant (Faslodex®) 2/ 3/ or 4/: Everolimus (Afinitor®) + exemestane (Aromasin®)

Pre-menopause: Zoladex® (goserelin) (to induce a chemical menopause) New: Palbociclib

- Highly selective and reversible inhibition of cyclin 4 and 6 dependent kinases. Cyclin 1 and CDK4/ 6 are downstream of multiple signalling pathways leading to cell proliferation.
- By inhibiting CDK4/6: blocks cells in G1 phase -> reduces cell proliferation

b. Chemotherapy

- After failure of hormone therapy or in the case of threatening metastases.
- Main molecules.
  - Anthracyclines (epirubicin, caelyx®, myocet®)
  - Taxanes: docetaxel, paclitaxel
  - 3rd line: capecitabine(Xeloda®): oral pro-drug of 5FU
  - 4th line: eribulin (Halaven®): inhibitor of microtubules, different from taxanes.

- 5th line: Carbo/ cisplatin, gemcitabine, navelbine, methotrexate

c. Targeted therapies

1st choice HER2+ metastatic breast cancer: chemotherapy and anti-HER2 because

- More aggressive disease
- High risk+ of visceral metastases+ brain
- Less hormone-sensitive
- 1st line: Perjeta-Herceptin-Taxane (Cleopatra study)
- 2nd line: Kadcyla (Emilia study)
- 3(rd) Tykerb+Xeloda

Lung cancer[81]

The regimen most commonly used to treat lung is based on platinum salts (cisplatin, or carboplatin if cisplatin is contraindicated), administered by intravenous infusion (injectable route).

In non-small cell lung cancer, platinum is usually combined with one of the following conventional chemotherapy drugs

- Paclitaxe
- Docetaxe
- Gemcitabin
- Vinorelbin

However, a single conventional chemotherapy drug may be administered in certain metastatic stages, depending on the patient's age and general condition. This is known as monotherapy or monochemotherapy.

In small-cell bronchial cancer, platinum is usually combined with etoposide (injectable or soft capsules).

VIII. *Survival*

Malignant pleurisy is a serious complication of cancerous disease and generally indicates a poor prognosis for survival, as it occurs in patients at an advanced stage of cancerous disease.

Survival from diagnosis averages 3 to 6 months, with a mortality rate of 54% at 1 month and 84% at 6 months. Patients whose primary cancer is of bronchial or digestive origin have the poorest survival.[82]

Longer survival is observed in breast neoplasia in cases where there is a response to chemotherapy and/or hormone therapy, averaging 6 to 13 months from diagnosis.[83] It also depends on the associated metastatic sites: when the effusion is the only metastatic site, survival is estimated at 48 months, whereas in the presence of other secondary sites, survival is reduced to around 12 months.[84]

Our series showed an estimated overall survival of 6.6 months. This result is in line with those reported in the literature.

This can be explained by the progressive nature of the disease.

Table 18: Overall survival according to the authors.

	ATOINI	Ny	Schnewind	Viallat	Our series
Survival time	6.5 months	5 months	7.5 months	6.4 months	6.6 months

CONCLUSION

Metastatic pleurisy is the main cause of pleural effusion and a frequent clinical situation in cancer patients. Malignant pleural effusion occurs in more than 50% of patients with metastatic cancer.

Malignant pleurisy impairs patients' quality of life due to symptoms dominated by dyspnoea, cough and pain, and reflects the advanced stage of the cancer disease. Only a minority of effusions will be improved by anti-cancer treatment.

Management of recurrent malignant pleurisy is mainly palliative, providing relief from symptomsimproving quality of life and preventing recurrence. Treatment varies according to the patient's general condition, prognosistype of tumour and pulmonary re-expansion.

Pleural talcation by video thoracoscopy is an effective and safe technique for recurrent neoplastic pleurisy.

This study shows that thoracoscopic talc pleurodesis is an effective symptomatic treatment that is well tolerated with few side effects, helping improve the quality life of cancer patients.

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