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ORIGINAL

Efficacy of autologous blood pleurodesis in patients with malignant pleural effusions

Eficacia de la pleurodesis con sangre autóloga en pacientes con derrame pleural maligno

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ABSTRACT

Objective: the general objective was to evaluate the efficacy of autologous blood pleurodesis in patients with malignant pleural effusion in services of Thoracic Surgery and General Surgery of at the Autonomous Service "Hospital Central de Maracay", in the period from July, 2023 to August, 2024.
Method: clinical-epidemiological research of descriptive, experimental, observational, prospective and longitudinal type. The population consisted of 100 patients with a diagnosis of pleural effusion, from which a sample of 21 patients was selected. Variables evaluated: age, sex, clinical manifestations, personal history, imagenology, cytological and anatomopathological diagnosis, side effects, post-procedure resolution and pleural catheter removal, as well as hospital stay.
Results: mean age: 64,90 years. The majority of patients were women. Dyspnea was the main clinical manifestation. Breast cancer was the predominant antecedent. Out of 21 patients, 18 of them had complete resolution of the pathology within the first 24 hours after the procedure, with no adverse effects and radiologically evident pulmonary expansibility. Pleural catheter removal and hospital discharge were early, within the first 24 and 72 hours respectively.
Conclusion: pleurodesis with autologous blood is presented as a fundamental therapeutic option, in view of being an innovative and effective technique for the treatment of these effusions, providing symptom relief and significant pulmonary expansibility, showing satisfactory results in a short period of time, for which we recommend its implementation, training of health personnel and studies to confirm the benefits and its cost-effectiveness evaluation.

Keywords: Pleurodesis; Autologous Blood; Malignant Pleural Effusion.

RESUMEN

Objetivo: el objetivo general fue evaluar la eficacia de la pleurodesis con sangre autóloga en pacientes con derrame pleural maligno en los servicios de Cirugía de Tórax y Cirugía General del Servicio Autónomo Docente Hospital Central de Maracay, en el período comprendido desde Julio de 2023 hasta Agosto de 2024.
Método: investigación clínico-epidemiológica de tipo descriptiva, experimental, observacional, prospectivo y longitudinal. La población consistió en 100 pacientes con diagnóstico de derrame pleural, seleccionando una

muestra de 21 pacientes. Se evaluaron variables como: edad, sexo, manifestaciones clínicas, antecedentes personales, diagnóstico imagenológico, citológico y anatomopatológico, efectos secundarios, resolución posterior al procedimiento y retiro de catéter pleural, así como estancia hospitalaria.
Resultados: mostraron que la edad promedio es de: 64,90 años. La mayoría de los pacientes eran mujeres. La disnea fue la manifestación clínica principal. El cáncer de mama predominó como antecedente. De 21 pacientes, 18 de ellos tuvo resolución completa de la patología dentro de las primeras 24 horas posterior al procedimiento, no presentando efectos adversos y con expansibilidad pulmonar radiológicamente evidenciable. El retiro de catéter pleural y el egreso hospitalario fueron tempranos, dentro de las primeras 24 y 72 horas respectivamente.
Conclusiones: la pleurodesis con sangre autóloga se presenta como una opción terapéutica fundamental, en vista de ser una técnica innovadora y efectiva para el tratamiento de estos derrames, proporcionando alivio de síntomas y una expansibilidad pulmonar significativa, mostrando resultados satisfactorios en un corto período de tiempo por lo cual se recomienda su implementación, capacitación del personal de salud y estudios que confirmen los beneficios y su evaluación costo-efectividad.

Palabras Clave: Pleurodesis; Sangre Autóloga; Derrame Pleural Maligno.

INTRODUCTION

Pleural effusion is the presence or pathological accumulation of fluid in the pleural space. Similarly, malignant pleural effusion is when the fluid found tests positive for malignancy in cytology or histology, indicating an advanced tumor stage and requiring palliative treatment.[1,2]

There are different causes of pleural effusion, one of which is evident in people with cancer, where pleural effusions are often malignant. This means there are cancer cells in the pleural space, which cause fluid to accumulate. In other cases, pleural effusion may occur as a result of inflammation, lung obstruction, trauma, or another medical condition that may not be due to cancer.[2]

It should be noted that cancer is a general term used to refer to a large group of diseases that can affect any part of the body. A defining characteristic of cancer is the rapid spread of abnormal cells that exceed their normal boundaries and can invade adjacent parts of the body or spread to other organs, a process known as metastasis. Metastatic spread is the most common cause of death in this disease.[1]

In terms of new cases, the most common cancers in 2020, according to the World Health Organization, in descending order, were breast, lung, colorectal, prostate, skin (excluding melanoma), and stomach. Of these types of cancer, those that caused the most deaths, in descending order, were as follows: Lung, colorectal disease, liver, stomach, and breast cancer.[1]

About malignant pleural effusions, primary lung neoplasms in men and breast cancer in women account for more than half of cases. These are followed by lymphoma and ovarian cancer, while in 8 % or more of cases, the primary tumor cannot be identified. Therefore, most malignant pleural effusions represent metastases from a primary extrapleural tumor, and less than 2 %, with some geographical variation, originate in the pleura. The most common neoplasms associated with malignant pleural effusion are those of pulmonary origin, in 50 % of cases, breast (20 % of cases), lymphomas and mesotheliomas (10 % of cases), and, less frequently, ovarian and gastrointestinal tumors.[2]

The primary characteristic clinical manifestation is pleuritic pain caused by an inflamed parietal pleura, which is nociceptive. The most common symptom is dyspnea preceded by coughing, which may progress with the size and increase of the effusion. Dyspnea may be accompanied by desaturation, such as changes in the perfusion, oxygenation, and ventilation mechanisms. Another sign is weight loss, which is associated with chronic infection or malignancy. It is essential to determine whether the effusion is unilateral or bilateral because this also plays a significant role in the diagnosis.[1,2]

The diagnosis of pleural effusion is based on demonstrating malignant cells in the pleural fluid. The presence of low eosinophil levels, pH, and glucose are suggestive of a malignant prognosis in the pleural fluid and of a positive cytology. Similarly, the determination of specific tumor markers such as Carcinoembryonic Antigen (CEA), CA 15-3, and CA 549 in the pleural fluid or blood increases the sensitivity of the pleural cytochemical study.[3]

In the presence of malignant pleural effusion, the therapeutic solution to be considered should allow the pleural cavity to be closed, achieved through a non-invasive procedure called pleurodesis. Traditionally, it is indicated for recurrent neoplastic effusions that displace the mediastinum, whose dyspnea improves when the effusion is evacuated and recurs when it accumulates again; it is even used if the patient is registering volumes greater than 150 ml per day through their tube.[4]

This procedure consists of instilling sclerosing substances, which can be of various types: chemical, infectious,

traumatic, or through surgical techniques directly into the pleural cavity, causing the pleura to permanently adhere in the vast majority of cases.[1,2,4]

Chemical pleurodesis should be considered in the treatment of symptomatic patients with malignant pleural effusion who have a survival rate of more than 4 months and are not candidates for adjuvant therapies such as chemotherapy or those who do not respond to it, as a method that, although it has not been proven to prolong patient survival, may improve their quality of life. Among the most commonly used agents are sterile talc, bleomycin, iodopovidone, and oxytetracyclines.[2,5]

The technique of autologous blood pleurodesis is an accepted option for treating malignant pleural effusion, mainly in patients with high surgical anesthetic risk or those who, given the advancement of the neoplastic process, warrant palliative treatments to improve their quality of life. In addition, it facilitates access to treatment due to its low cost and reduced adverse effects.[2,5]

In a study conducted in 2018, a total of 123 cases of patients with malignant pleural effusion who received autologous blood pleurodesis versus pleurodesis with sterile talc were evaluated for 30 days to assess the efficacy of pleurodesis as well as the occurrence of adverse events. According to the study parameters, the overall success rate was 82,0 %, comparable to the talc pleurodesis group at 87,0 %.[4]

On the other hand, in 2019, in a prospective non-randomized study that included a total of 12 patients who attended the thoracic surgery clinic, it was observed that the group treated with sterile talc had an effectiveness rate of 71,4 % and a failure rate of 28,6 %. A 100 % efficacy was observed in the group treated with povidone-iodine.5 Similarly, in 2021, a study with 60 patients in the Department of Thoracic Diseases at the Eskisehir Osmangazi University Faculty of Medicine, Turkey. The overall success rate of pleurodesis was confirmed to be 72,0 % in the autologous blood group and 69,0 % in the talc group. The most common complications were fever and pain, which were higher in the talc group.[6]

The available literature confirms that pleurodesis with the patient's blood is a highly effective, minimally invasive method with a lower risk of complications and easy access, which generated interest in applying this procedure at the Central Hospital of Maracay, whose clinical and technological impact can create benefits in the rapid and timely resolution of the pathology, fewer postoperative complications, greater patient acceptance, and a significant reduction in hospital costs compared to traditional procedures.

In this regard, the researchers evaluated the efficacy of pleurodesis with autologous blood in patients with malignant pleural effusion in the Thoracic Surgery and General Surgery departments of the Autonomous Teaching Hospital of Maracay.

METHOD

This study was conducted as a descriptive, experimental, observational, prospective, and longitudinal clinical-epidemiological investigation from July 2023 to August 2024 at the Thoracic Surgery and General Surgery Department of the Autonomous Central Hospital of Maracay, Las Delicias Parish, Girardot Municipality, Maracay City, Aragua State, Venezuela.

During the study period, the population that attended the Thoracic Surgery and General Surgery Department of the Autonomous Central Hospital of Maracay consisted of 100 patients with pleural effusion of different etiologies, from which a simple sample of 21 patients diagnosed with malignant pleural effusion was taken through imaging studies, specifically posteroanterior and lateral chest X-rays and pleural fluid cell studies obtained by thoracentesis. The Light criteria were calculated (together with LDH and total serum protein results), generating exudate in all samples and finally confirming the presence of malignancy through anatomopathological studies such as pleural biopsy.

Given that pleurodesis with autologous blood is used primarily to close persistent air leaks caused by spontaneous pneumothorax, the application techniques used worldwide were considered and adapted to the Autonomous Central Hospital of Maracay standards. The method described in other countries indicates that 120-150 ml of autologous blood without anticoagulants should be extracted in blood collection bags from the humeral artery, radial artery, or superficial veins of the lower extremities to be subsequently administered through the pleural tube or catheter, with subsequent elevation above the height of the patient's bed to approximately 40 cm for at least 24 hours, associated with postural changes of the patient to improve its distribution in the pleural cavity.

However, the technique was modified in the case of this study, where it was performed as follows: Following rigorous aseptic and antiseptic procedures and placing sterile surgical drapes, 1 to 2 cc per kilogram of weight (1-2 cc/kg) was extracted from the femoral artery using a 100 cc syringe previously impregnated with anticoagulants (sodium heparin). Then, the entire amount of blood extracted was instilled through the pleural catheter while instructing the patient to take deep breaths. Once it was confirmed that all the blood was inside the cavity, the catheter was closed for 4 hours while the patient was asked to change positions to ensure proper distribution of the blood in the pleural cavity.

Next, a post-application imaging study was performed, which consisted of a posterior-anterior and lateral

chest X-ray (depending on the affected area). Once the image was available, the pleural catheter was opened, and a chest X-ray was requested for follow-up 24 hours after the procedure. Based on the imaging study results, if lung expansion was present, the pleural tube was removed, and the patient was discharged from the hospital, provided there were no other comorbidities that would require further hospitalization.

Similarly, for epidemiological surveillance, a 20-question instrument was used to assess three parameters: clinical and epidemiological data (age, sex, personal history, and clinical manifestations of the disease), diagnostic methods for malignant pleural effusion (radiological signs, pleural fluid cytochemical results), hemoglobin levels before the procedure (greater than or less than 11 g/dL), and evolution of the procedure (days 1 and 7). Probable adverse events: pain, fever, respiratory failure, pulmonary edema, atelectasis, and others, in addition to imaging studies such as posteroanterior and lateral chest X-rays).

The study was conducted with all patients diagnosed with this pathology to avoid a random error range.

RESULTS

Table 1. Epidemiological data, clinical manifestations, and personal history of patients who attended the Thoracic Surgery and General Surgery Department of the Autonomous Service of the Central Hospital of Maracay.

EPIDEMIOLOGICAL DATA		n*	%H	IC95 %I
Age (x+ DE)	64,90±11,75			
Age (groups)	Over 60 years old	16	76,19	52,83-91,78
	Under 60 years old	5	23,81	8,22-47,17
Sex	Female	11	52,38	29,78-74,29
	Male	10	47,62	25,71-70,22
Clinical Manifestations	Dyspnea	13	61,90	38,44-81,89
	Pain	6	28,57	11,28-52,18
	Cough	2	9,52	1,17-30,38
Personal Background	Breast cancer	9	42,86	21,82-65,98
	Lung cancer	6	28,57	11,28-52,18
	Pleural disease	5	23,81	8,22-47,17
	Bullous disease	1	4,76	0,12-23,82

Note: n*: Frequency. %H: Percentage. IC95 %I: 95 % confidence interval

The average age was 64,90 during the study period, with a standard deviation of 11,75 (table 1). Likewise, in the age group, the group over 60 predominated, that is, 76,19 %, as opposed to the age group under 60, which represented only 23,81 % of the population (table 1).

Despite a minimal difference in the study's predominant gender, females prevailed with 52,38 % of the results, while males made up 47,62 % of the sample studied (table 1).

Similarly, the predominant clinical manifestation was dyspnea in 61,90 % of the population, while pain represented 28,57 % of cases, and cough was present in only 9,52 % of the patients evaluated (table 1). Finally, regarding the personal history of the patients studied, breast cancer was the first diagnosis, representing 42,86 % of the results, followed by lung cancer, which was evident in 28,57 % of cases. In comparison, 23,81 % were represented by pleural disease; finally, 4,76 % of the subjects had bullous disease as a history. Although this condition cannot cause malignant pleural effusion, it was not excluded from the study in question (table 1).

Regarding the affected lung field, 52,38 % presented imaging studies such as posteroanterior and lateral chest X-rays involving the right lung field. In comparison, 47,62 % had involvement in the left lung field (table 2). Similarly, the predominant radiological sign in these imaging studies was the meniscus sign in 71,43 % of patients, while complete lung field opacity was evident in 23,81 %. The remaining 4,76 % were represented by the deep groove sign, suggesting pneumothorax (table 2).

The result of the Light criteria calculation, obtained by comparing the cytological study of the pleural fluid received in the diagnostic thoracentesis before pleural catheter placement and the serum results of total and fractionated proteins and lactate dehydrogenase, to classify pleural effusion as transudate or exudate, showed that 95,24 % of the sample was exudate. In the remaining 4,76 %, these criteria were not applied because they were due to another pathology (table 2).

Similarly, once the imaging and cytological diagnosis had been made, the confirmatory diagnosis was made through an anatomopathological study, i.e., pleural biopsy, which yielded 90,48 % positive results for malignancy. Although the natural course of the disease was suggestive of malignancy, 4,76 % did not authorize the study. Similarly, the remaining 4,76 % did not warrant the survey because it did not apply to the current

pathology (persistent air leak) (table 2).

Finally, patients with hemoglobin levels greater than 11 g/dl who underwent the procedure accounted for 71,43 % of the study. The remaining 28,57 % were those with hemoglobin levels below 11 g/dl (table 2).

Table 2. Affected lung field, radiological diagnosis, and pleural fluid cell study in patients who attended the Thoracic Surgery and General Surgery clinic.

		0	%[H]	IC95 %[I]
Affected lung field	Law	11	52,38	29,78-74,29
	Left	10	47,62	25,71-70,22
Radiological diagnosis	Meniscus sign	15	71,43	47,82-88,72
	Complete opacity	5	23,81	8,22-47,17
	Pneumothorax	1	4,76	0,12-23,82
Pleural fluid studies (cytokinetic)	Exudate	20	95,24	76,18-99,88
	Not applicable	1	4,76	0,12-23,82
Anatomopathological study (pleural biopsy)	Positive	19	90,48	69,62-98,83
	Not completed	1	4,76	0,12-23,82
	Not applicable	1	4,76	0,12-23,82
Hemoglobin levels	Greater than 11gr/dl	15	71,43	47,82-88,72
	Less than 11gr/dl	6	28,57	11,28-52,18

Note: IC95 %[I]: 95 % confidence interval

The procedure was performed taking into account the imaging, cytochemical, and anatomopathological results previously presented for the diagnosis of malignant pleural effusion and the patient's hemoglobin levels before the pleurodesis was performed. This way, the application was evaluated in the first 24 hours and then 7 days after application. Due to the above, within the first 24 hours after pleurodesis, the pathology was resolved in 85,71 % of cases, while in 14,29 %, there was no evidence of resolution (table 3).

Notably, at the time of evaluation at 24 hours, no apparent adverse effects were observed in 71,43 % of the sample. However, coughing was present in 14,29 % of patients, while dyspnea was reported in 19,5 % of cases and pain in only 4,76 % of individuals (table 3).

Subsequently, on visualization of radiological images 24 hours after the procedure, 85,71 % of the population had complete lung expansion. However, 9,52 % of cases showed signs of persistent meniscus, and 4,76 % showed atelectasis of the affected lung field (table 3).

The patients were then reevaluated 7 days after pleurodesis, where 76,19 % of the sample showed complete resolution, while 14,29 % did not have the desired effect and 9,52 % did not attend follow-up. Similarly, 76,19 % showed no adverse effects, 9,52 % presented persistent pleural effusion, and 4,76 % of the sample manifested trapped lung syndrome, while the remaining 9,52 % did not attend the evaluation 7 days after the procedure (table 3).

Similarly, radiological examination showed complete lung expansion in 76,19 % of the study subjects. However, 9,52 % could not be evaluated because they did not attend the evaluation consultation 7 days later. Meanwhile, the remaining 14,28 % were divided equally, i.e., 4,76 % each, into three groups, with findings of the opacity of the affected lung field, Meniscus sign, and atelectasis, respectively (table 3).

Therefore, the time between the procedure's application and the removal of the pleural catheter was beneficial for the patients. In 61,90 % of the cases, the catheter was removed within 24 hours after the pleurodesis was performed. In 23,81 % of patients, the catheter was removed between 48 and 72 hours after pleurodesis, and only in 14,29 % of cases could it not be removed (table 3).

Similarly, the adequate performance of pleurodesis, the decrease in the occurrence of adverse effects, the noticeable total lung expansion, and the early removal of the pleural catheter after application were sufficient grounds for the patients to be discharged satisfactorily in less than 3 days representing 66,67 % of the total sample. Others were discharged in less than 5 days due to evaluations by other services for other underlying conditions, representing 19,050 % of the population, and only 14,29 % were not discharged due to complications specific to the procedure (table 3).

It was determined that, within 24 hours after the procedure, there was radiological resolution of the pathology with lung expansion of 85,71 %. Subsequently, 9,52 % of the sample presented signs of meniscus in these first hours, and 4,76 % developed atelectasis. On the other hand, 7 days after pleurodesis, it was found that 76,19 % of the sample evolved satisfactorily, maintaining complete lung expansion. Subsequently, 14,28 % presented variations in radiology, in which the following was evident: moderate opacity in 4,76 % of patients,

meniscus sign also represented by 4,76 %, and atelectasis, also in 4,76 % of cases. The remaining 9,52 % of the population consisted of patients who did not attend follow-up consultations. According to the radiological evaluation, the difference between the first and seventh-day controls was statistically significant (P: 0,0109) (table 4).

Table 3. Application of the procedure and its evolution at 1 and 7 days in terms of adverse effects, radiology, pleural catheter removal time, and hospital discharge in patients who attended the Thoracic Surgery and General Surgery consultation

EVOLUTION		n*	%H	IC95 %
Evaluation within 24 hours	Resolution	0	85,71	63,66-96,95
	No resolution	3	14,29	3,05-36,34
Adverse effects within 24 hours	None	15	71,43	47,82-88,72
	Cough	3	14,29	3,05-36,34
	Dyspnea	2	9,52	1,17-30,38
	Pain	1	4,76	0,12-23,82
Radiology in 24 hours	Clean field	18	85,71	63,66-96,95
	Meniscus sign	2	9,52	1,17-30,38
	Atelectasis	1	4,76	0,12-23,82
7-day evaluation	Resolution	16	76,19	52,83-91,78
	No resolution	3	14,29	3,05-36,34
	Did not attend	2	9,52	1,17-30,38
Adverse effects within 7 days	None	16	76,19	52,83-91,78
	Persistent pleural effusion	2	9,52	1,17-30,38
	Did not attend	2	9,52	1,17-30,38
	Symptoms of trapped lung	1	4,76	0,12-23,82
Radiology in 7 days	Clean field	16	76,19	52,83-91,78
	Not evaluated	2	9,52	1,17-30,38
	Opacity	1	4,76	0,12-23,82
	Meniscus	1	4,76	0,12-23,82
	Atelectasis	1	4,76	0,12-23,82
Pleural catheter removal	After 24 hours	13	61,90	38,44-81,89
	48 to 72 hours	5	23,81	8,22-47,17
	Not removed	3	14,29	3,05-36,34
Hospital discharge	Less than 3 days	14	66,67	43,03-85,41
	Less than 5 days	4	19,05	5,45-41,91
	Not discharged	3	14,29	3,05-36,34

It was also demonstrated that 71,42 % had no adverse effects in the first 24 hours after the procedure. Only 28,56 % of patients presented adverse effects, with coughing in 14,28 %, followed by dyspnea in 9,52 % and pain in 4,76 %. However, on day 7 at the follow-up visit, it was noted that 76,19 % remained without adverse effects, while pleural effusion persisted in 9,52 % of cases. Only 4,76 % had trapped lung syndrome, and the remaining 9,52 % were those who did not attend the follow-up visit after the procedure. This confirms a statistically significant difference in the onset of adverse effects between the two evaluation days (P:0,0034) (table 4).

Finally, given the patients' satisfactory resolution, the minimal occurrence of adverse effects, and the notable lung expansion in almost all individuals, early removal of the pleural catheter was considered. As a result, in 72,22 % of the study participants, the catheter was removed 24 hours after application. In comparison, 27,78 % of the sample was removed between 48 and 72 hours later due to factors unrelated to the pleural catheter itself. Similarly, in patients who did not experience resolution of the pathology, the catheter was not removed, accounting for 100 % of these individuals. This reflects a statistically significant probability value (P: 0,0000)(table 5).

Consequently, hospital discharge was marked by the successful evolution of most patients, with 77,78 % discharged within the first 3 days after pleurodesis. The remaining 22,22 % were discharged within 5 days after the procedure due to underlying comorbidities, such as systemic arterial hypertension and type 2 diabetes mellitus, as assessed by the internal medicine service. Patients who did not experience pathology resolution

after the procedure could not be discharged from the hospital, as demonstrated in 100 % of this sample. Statistical significance is reflected in the relationship between the parameters studied (P: 0,0000)(table 5).

Table 4. Relationship between radiological control and adverse effects that appeared within 1 day and 7 days after the procedure in patients who attended the Thoracic Surgery and General Surgery clinic.

		Day 1 N=21 n (%)*	Day 7 N=21 n (%)*	P^H
Radiology	Lung expansionability	18 (85,71)	16 (76,19)	
	Meniscus sign	2 (9,52)	1 (4,76)	
	Moderate opacity	-	1 (4,76)	0,0109
	Atelectasis	1 (4,76)	1 (4,76)	
	Not evaluated	-	2 (9,52)	
Adverse effects	None	15 (71,42)	16 (76,19)	
	Cough	3 (14,28)	-	
	Dyspnea	2 (9,52)	-	0,0034
	Pain	1 (4,76)	-	
	Persistent pleural effusion	-	2 (9,52)	
	Trapped lung syndrome	-	1 (4,76)	
	Not evaluated	-	2 (9,52)	

Note: N (%)*: Frequency (Percentage). P^H: Probability value.

Table 5. Relationship between resolution of pathology and early removal of pleural catheter and hospital discharge after procedure in patients who attended the Thoracic Surgery and Surgery consultation.

		Resolution N=18 n (%)*	No resolution N=3 n (%)*	P^H
Pleural catheter removal	After 24 hours	13 (72,22)	-	
	48 to 72 hours	5 (27,78)	-	P 0,0000
	Not removed	-	3 (100)	
Hospital discharge	Less than 3 days	14 (77,78)		
	Less than 5 days	4 (22,22)		P 0,0000
	Not discharged		3 (100)	

Note: N (%)*: Frequency (Percentage). P^H: Probability value.

DISCUSSION

Lung cancer, breast cancer, lymphoma, and leukemia cause most malignant pleural effusions. It is also called malignant pleural effusion.[7] Malignant pleural effusions most commonly present with clinical manifestations such as dyspnea and pleuritic chest pain and may also be associated with pleuritic chest pain. Physical examination findings may range from normal to dullness on percussion, absence of fremitus, and decreased breath sounds.[8] This is similar to the results obtained in this study, where dyspnea and chest pain were the symptoms presented by the patients, respectively. At the same time, another added symptom, a dry cough, without the presence or suspicion of any respiratory infection or probable allergens.

The correct diagnosis of malignant pleural effusion should be based not only on physical examination and patient history but also on imaging studies such as chest X-rays and cytological studies such as pleural fluid cell count after thoracentesis, and, as a confirmatory diagnosis, biopsy as an anatomopathological study.[3] This is consistent with the present study, which found that most of the patients investigated had radiological images with characteristic signs such as the meniscus sign and complete opacity, as well as pleural cytology results suggestive of exudate and anatomopathological confirmation of malignancy through pleural biopsies performed in the patients studied.

According to the guidelines proposed by the British Thoracic Society, pleural effusions confirmed as malignant by cytology and anatomopathological examination account for 50 % of all pleural effusions that may occur in a hospital setting. In many cases, it is the initial presentation of a cancerous disease as a manifestation of a primary tumor or pulmonary or pleural metastasis. This condition is recurrent and highly symptomatic and is therefore considered difficult to manage. The most reasonable treatment options are the use of permanent

catheters, minimal thoracotomy with a chest tube, and chemical pleurodesis with sclerosing substances that cause inflammation and pleural scarring to prevent its accelerated production.[9] That is why, in this research, autologous blood (or the patient's blood) was used as an agent for performing pleurodesis. Many international studies use this method to close persistent air leaks caused by spontaneous pneumothorax. However, few studies reveal the use of this technique in the management of malignant pleural effusions, making it an innovative technique.

Pleurodesis aims to provide definitive treatment for pleural effusion hyperproduction and symptom relief. It is a palliative treatment that is expected to be long-lasting. A previous study described that simply placing a permanent drainage catheter and leaving it in place resulted in a high rate of spontaneous pleurodesis before the use of any sclerosing agent. However, recurrence was high after hospital discharge.[10] Similarly, in a comparative study between sterile talc and autologous blood as sclerosing agents, it was determined that pleurodesis performed with autologous blood had equivalent efficacy compared to pleurodesis with sterile talc, producing less fever and pain after application of the technique, with significant radiologically evident lung expansion.[4] Comparing these studies with the present investigation, it was possible to affirm that the patient's blood can be taken as a sclerosing agent, which generates a blood patch between the two pleural layers, thus establishing their closure and the consequent lung expansion, without adverse effects such as those produced by other chemical agents or mechanical techniques.

Other studies confirm that, with the use of the aforementioned technique with the patient's blood, prolonged use of pleural catheters decreased considerably, as did hospital stays.[4] This confirms the findings of this study, in which the majority of patients in the sample had their pleural catheters removed within a maximum of 72 hours after application and were discharged from the hospital between 3 and 5 days after pleurodesis due to decompensation in other systems such as the endocrine or cardiac systems. Seventy-two hours after application, hospital discharge occurred between 3 and 5 days after pleurodesis due to decompensation in other systems, such as the endocrine or cardiac systems. However, satisfactory results had already been obtained from pleurodesis.

CONCLUSION

Malignant pleural effusions represent one of the most challenging complications in the management of cancer patients, both due to their prevalence and their painful and recurrent symptoms. Accurate diagnosis of these effusions is essential and achieved through imaging, pleural cytology, and anatomopathological studies.

Pleurodesis with autologous blood is a fundamental therapeutic option, as it is an innovative, effective, and economical technique for treating this condition, providing almost instant relief of symptoms and significant lung expansion, thus demonstrating satisfactory results in a short period. Therefore, the use of autologous blood as a sclerosing agent in pleurodesis for the treatment of malignant pleural effusions is an effective and less invasive alternative with promising results, even comparable to traditional methods, in addition to reducing the need for and duration of pleural catheters and hospital stays. This innovative approach could offer more efficient management with fewer adverse effects in cancer patients who undergo this therapeutic technique as a palliative method.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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