



Medical Pleurodesis with Povidone Iodine for Malignant Pleural Effusion in Low Income Countries

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Abstract: Introduction: Chemical pleurodesis may be the best available treatment for recurrent and some pleural effusions trouble when the underlying cause cannot be treated. A wide variety of pleural irritants have been used, but the search for the ideal agent for pleurodesis continues. The aim of our study is to evaluate the efficacy and safety of iodo-povidone as an agent to treat recurrent pleural effusion. Materiel and methods: It's a retrospective study of all cases treated in the surgery department of the regional hospital of Agadir for a recurrent pleural effusion in witch malignancy is confirmed. Results: Are included in the study 74 patients with a mean age of 61 years and a female dominance of gender. All patients in our series were symptomatic with a predominance of chest pain and dyspnea as revelatory signs. Lung cancer is the first cause incriminated in recurrent pleural effusion followed by breast cancer. All patient of the study were drained with a chest tube with caliber greater than 20 Fr and the success of the medical pleurodesis was considered in 91 % of cases with no signs of complications. Conclusion: Medical pleurodesis requires a multidisciplinary team and inter-professional communication between specialists in pulmonary medicine, thoracic surgery, and oncology, especially in patients with malignancy as an etiology of the disease. Povidone-iodine is a very effective sclerosing agent that allows effective pleural symphysis. Its cost, safety and availability represent the characteristics that have made its use especially in developing countries of major interest compared to other methods.

Keywords: Pleurodesis, Pleural Symphysis, Recurrent Effusion

1. Introduction

Medical pleurodesis is the therapeutic procedure consisting in the creation of pleural symphysis between the pleural layers the parietal and visceral pleura by the administration of several products including talc, tetracycline, bleomycin and povidone iodine [1, 2]. The main indications are recurrent malignant effusion and recurrent spontaneous pneumothorax. Several studies were interested in the evaluation of the methods of pleurodesis with evaluation of the effectiveness, cost, duration of drainage and complications related to the studied product but without confirmation of a universal consensus [3]. Our study is a descriptive study of the cases taken in our service by medical pleurodesis with pvidone iodine with review of the literature.

2. Material and Methods

Our work is a retrospective study of the cases taken in our training for confirmed and recurrent malignant pleurisy and for which they were treated by medical pleurodesis with povidone iodine. All the patients drained by large chest tube > 20 Fr benefited from instillations of a mixture of Povidone iodine, xylocaine 2 % and saline through the tube.. They were described all the clinical, biological and radiological characteristics of the patients with evaluation of the effectiveness of the product, cost, complications and the short and long term evolution clinical and biological signs. All characteristics were entered and evaluated by excel and SPSS software.

Inclusion criteria: All patients diagnosed with histologically

confirmed malignant pleurisy and whose drainage was done by a large drain > 20 Fr, and whose pulmonary expansion was greater than 75% of the parenchyma.

3. Results

They were included 74 patients all hospitalized in our hospital for pleurisy of malignant origin confirmed after histological study. The average age was 61.57 years (5 years), with a predominance of females with a sex ratio of 0.64 M/F. The majority of the patients presented with progressive dyspnea (40%) or chest pain (30%) or an incidental finding on a routine check-up (15%). Pleural effusion was bilateral in 5% of cases and required drainage followed by medical pleurodesis with povidone-iodine on both sides alternatively either during the same hospitalization or after success on the first side.

Lung cancer represents the first cause of malignant pleurodesis in our series with a rate of 29%, followed by breast cancer 25% and lymphomatous pathology 20% and digestive cancer with 8% of cases. All patients were drained with a drain of caliber greater than 20 Fr, and the average duration of drainage was 10 days with extremes of 6 days to 31 days. The success of medical pleurodesis was considered by the absence of recurrence during the 4 weeks following the removal of the drain and which was about 91% in our series. The immediate and medium term complications after medical pleurodesis were dominated by pain which was treated by first level analgesia, uncomplicated fever in our series, pyothorax in only 1 case and without abnormalities of the biological examinations exploring the renal and thyroid functions. All the patients of our series benefited from an analgesic treatment by paracetamol and injectable acupan before the procedure to prevent immediate pain, and a standard radiography of the thorax face was made at day 1, day 3 and day 5 systematically and day 7 and day 10 if still drained. Renal function tests were performed in all patients and did not show any abnormalities, and thyroid function tests did not show any abnormalities when performed.

4. Discussion

Pleural effusion of malignant origin is frequent and its recurrent character represents the ultimate challenge for the practitioner. Povidone-iodine is one of the most commonly used products and its efficacy is still a matter of debate, but its cost, availability and absence of allergic features represent an advantage to its use, especially in the intra-hospital area, especially in developing countries [1, 2]. The physiopathological mechanism of medical pleurodesis is explained by the creation of pleural symphysis and it seems that the process of pleurodesis is largely nonspecific and involves the pathways of pleural cell activation, the coagulation cascade, fibrin chain formation, fibroblast proliferation, and production of collagen and extracellular matrix components. Among these processes, the coagulation cascade, with a decrease in fibrinolytic activity and an

increase in fibrinogenesis, probably plays a central role, at least during the early response to the administration of the sclerosing agent [1]. Pleurodesis remains the reference treatment for recurrent effusions of any kind and medical pleurodesis keeps its indication in the treatment of malignant effusions which represents the 3 most frequent cause of pleurisy in the USA [3]. In the majority of series in the literature, malignant pleurisy is caused by lung cancer, breast cancer and lymphoma [3, 4], and medical pleurodesis is indicated in patients with rapid accumulation of pleural fluid <30 days, patients whose survival time exceeds 90 days and patients whose chemotherapy has not been effective on pleurisy [3, 5, 6]. Povidone-iodine represents a confidence element according to the literature in pleurodesis and allows pleural symphysis with a complete response of more than 90% [6-8]. They were evaluated all clinical parameters: visual analogical scale, temperature, blood pressure, heart rate, respiratory rate and oxygen saturation immediately and the daily standard radiography and biology of kidneys and thyroid at day 1 and day 4 and day 30 after pleurodesis. All studies have described an undesirable potential of povidone-iodine pleurodesis that stays minimal in the majority of cases, with a predominance of pain and fever without alteration of the renal function and thyroid balance in the subsequent biological examinations. On the other hand, some studies have reported major complications such as pyothorax [9, 10, 12] and loss of vision [9, 11], without any case of sudden death after pleurodesis described in the literature.

5. Conclusion

This usually requires a multidisciplinary team and inter-professional communication between specialists in pulmonary medicine, thoracic surgery, and oncology, especially in patients with malignancy as an etiology of the disease. Povidone-iodine is a very effective sclerosing agent that allows effective pleural symphysis. Its cost, safety and availability represent the characteristics that have made its use especially in developing countries of major interest compared to other methods.

Declarations

Ethics Approval and Consent to Participate

All participants are ok with participation

Consent for Publication

Verbally consents obtained

Availability of Data and Materials

All data are available and can be consult by contacting the corresponding author

Competing Interests

The authors declare no competing interests.

Authors' Contributions

Dr. F Ouchen: supervision

Dr. M Makloul: supervision

Pr. E Maidi: supervision, validation

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References

- [1] Walker-Renard PB, Vaughan LM, Sahn SA. Chemical pleurodesis for malignant pleural effusions. *Ann Intern Med.* 1994 Jan 1; 120 (1): 56-64. doi: 10.7326/0003-4819-120-1-199401010-00010. PMID: 8250457.
- [2] Mierzejewski, M., Korczynski, P., Krenke, R. et al. Chemical pleurodesis – a review of mechanisms involved in pleural space obliteration. *Respir Res* 20, 247 (2019). <https://doi.org/10.1186/s12931-019-1204-x>
- [3] Kilic, D., Akay, H., Kavukçu, Ş. et al. Management of Recurrent Malignant Pleural Effusion with Chemical Pleurodesis. *Surg Today* 35, 634–638 (2005). <https://doi.org/10.1007/s00595-005-2996-5>
- [4] Lamb C, Li A, Thakkar D, Lee P. Pleurodesis. *Semin Respir Crit Care Med.* 2019 Jun; 40 (3): 375-385. doi: 10.1055/s-0039-1693997. Epub 2019 Sep 16. PMID: 31525812.
- [5] Dikensoy O, Light RW. Alternative widely available, inexpensive agents for pleurodesis. *Curr Opin Pulm Med.* 2005 Jul; 11 (4): 340-4. doi: 10.1097/01.mcp.0000166587.24127.91. PMID: 15928503.
- [6] Olivares-Torres CA, Laniado-Laborín R, Chávez-García C, León-Gastelum C, Reyes-Escamilla A, Light RW. Iodopovidone pleurodesis for recurrent pleural effusions. *Chest.* 2002 Aug; 122 (2): 581-3. doi: 10.1378/chest.122.2.581. PMID: 12171835.
- [7] Agarwal R, Khan A, Aggarwal AN, Gupta D. Efficacy & safety of iodopovidone pleurodesis: a systematic review & meta-analysis. *Indian J Med Res.* 2012 Mar; 135 (3): 297-304. PMID: 22561614; PMCID: PMC3361864.
- [8] Aelony Y. Talc pleurodesis vs iodopovidone. *Chest.* 2003 Apr; 123 (4): 1318-9; author reply 1319. doi: 10.1378/chest.123.4.1318. PMID: 12684335.
- [9] Guinde J, Georges S, Bourinet V, Laroumagne S, Dutau H, Astoul P. Recent developments in pleurodesis for malignant pleural disease. *Clin Respir J.* 2018 Oct; 12 (10): 2463-2468. doi: 10.1111/crj.12958. PMID: 30252207.
- [10] Teixeira LR, Vargas FS, Puka J, Acencio MM, Antonangelo L, Terra RM, Damico FM, Pitta FG, Marchi E. Effectiveness and safety of iodopovidone in an experimental pleurodesis model. *Clinics (Sao Paulo).* 2013 Apr; 68 (4): 557-62. doi: 10.6061/clinics/2013(04)19. PMID: 23778345; PMCID: PMC3634956.
- [11] Wagenfeld L, Zeitz O, Richard G. Visual loss after povidone-iodine pleurodesis. *N Engl J Med.* 2007 Sep 20; 357 (12): 1264-5. doi: 10.1056/NEJMc070128. PMID: 17881764.
- [12] Genofre EH, Vargas FS, Acencio MM, Antonangelo L, Teixeira LR, Marchi E. Talc pleurodesis: evidence of systemic inflammatory response to small size talc particles. *Respir Med.* 2009 Jan; 103 (1): 91-7. doi: 10.1016/j.rmed.2008.07.021. Epub 2008 Sep 11. PMID: 18789662.