

The treatment by V.A.T.S. and M.A.C. of secondary neoplastic pleural effusion in the old patient (>70 years)

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Abstract. A secondary malignant pleural effusion is a common event in the evolution of some tumours. It is frequent in advanced phase, above all the breast cancer in the woman and the cancer of the lung in the man, but such pathology can interest also extra-thoracic cancers (ovary, colon, prostate, etc.) and the malignant lymphoma. In the majority of cases in order to obtain a good control of the effusion entity with reduction of the respiratory symptoms and improvement of the quality of life, palliative local therapy is indispensable. Numerous methods and substances have been proposed in the time for the treatment of the N.P.E. The talc pleurodesis executed in the old patients (>70 years) by means of the V.A.T.S. "one trough" and "Monitored Anaesthesia Care" (MAC) has shown valid procedure for the control of the secondary neoplastic pleural effusion, with little uneasiness for the patients, reduced complications and a sure effectiveness.

Key words: Talc pleurodesis, videothoracoscopy, analgosedation

Introduction

A secondary malignant pleural effusion is a common event in the evolution of some tumours. It is frequent in advanced phase (50% of cases); above all the breast cancer in the woman and the cancer of the lung in the man. But such pathology can interest also extra-thoracic cancers (ovary, colon, prostate, etc.) and the malignant lymphoma. For some pathology as lymphoma, breast and ovarian cancer the chemotherapy can be effective also in the control of the effusion without a specific local treatment (1). But in the majority of cases in order to obtain a good control of the effusion entity with reduction of the respiratory symptoms and improvement of the quality of life, palliative local therapy is indispensable (2). Numerous methods and substances have been proposed in the time for the treatment of the N.P.E., from simple thoracentesis to the pleurectomy by thoracotomy. The insufficient effectiveness of the method of the serial thoracentesis (3)

and important mortality that accompanies the pleurectomy in such patients has sped up the search for a method of pleural sclerosis by means of the introduction in the pleural space substances that determine adhesions and subsequent obliteration of the pleural space.

The modality that in the last years has become the "gold standard" of the treatment of the N.P.E. is the pleurodesis (fused pleural space) with talc carried out in videotoracoscopy. Of other song the increase of the medium age and the greater effectiveness of the treatments concurred to the extension of the survival in patients with cancer, growing the observation of patients with S.N.P.E. aged >70 years. For such reason we retrospectively studied a group of 73 patients with S.N.P.E., aged between 70 and 86 years, between January 2000 - December 2004, of whom 50 carried out talc pleurodesis by V.A.T.S., estimating some parameters in function of the treatment, complications and results.

Patients and methods

Seventy-three patients aged between 70 and 86 years, 39 males and 34 females of medium age 75,3 years, with secondary malignant pleural effusion has been studied in the period January 1 2000/December 31 2004. In 29 of them the malignant pathology was the breast cancer, while for 24 a lung cancer, causing a pleural effusion. Finally for 20 of them the original tumour was extra-thoracic, even if in 4 cases (all with diagnosis of adenocarcinoma not well differentiated) was not possible better to define the origin (Tab. 1). In all we executed the routine laboratory examinations, electrocardiophonogram and eocardiography, arterial blood gas analysis and spirometry, a TC total body for restaging the malignant disease and for an exact appraisal of the pleural effusion. Fibrobronchoscopy was carried out in 34 patients and in 8 cases was diagnostic for primary lung cancer. In 57 patients (78%) was executed more than one diagnostic and therapeutic thoracentesis. Diagnosis was obtained by means of cytology on the pleural liquid or by histological biopsy during videothoracoscopy. We excluded from our study all cases of effusion without sure diagnosis of cancer and the cases of lung cancer with "trapped lung" (4) non susceptible of a treatment by talc pleurodesis. The same anaesthetist made the preoperative anaesthesiological appraisal and the surgical procedure carried out by a single surgeon. All patients re-entered in class ASA III-IV. For such study we prepared an anaesthesia protocol (5) that excluding the general anaesthesia, concurred by means of local anaesthesia and neuroleptanalgesia (M.A.C. Monitored Anaesthesia Care) to the execu-

tion in nearly all the patients: we excluded the patients with Karnofsky performance status inferior to 40, those with expectation of life inferior to a month, a patient with lung cancer and comorbidity of Alzheimer-Perusini disease, and a patient 74 years old with breast cancer operated six years before that refused every treatment beyond the serial thoracentesis. Among the 23 patients excluded from the surgical therapy there where moreover 12 cases of breast cancer, 6 cases of lung cancer, a prostate cancer, a not Hodgkin lymphoma and one adenocarcinoma with a not better definite origin. In a patient with bilateral breast cancer, operated respectively 22 and 17 years before and dealt after the arise of the pleural effusion, an intense chemotherapy determined a pleural fibrosis revealed by TC scan of the thorax, well treated by serial thoracentesis distanced two, three months one from another.

In the 53 procedures of talc pleurodesis by VATS (6), the local anaesthesia was executed with ropivacaine 0.2% solution injected into the skin and subcutaneous layer; a cutaneous incision was performed and muscle wall and pleura anaesthesia was carried out under direct vision, for a total dose of local anaesthetics about 5-8 ml. During the surgical treatment administration of anaesthetics was modified according to the surgical needs, to the patients' vital parameters and algogenic features and to the length of the surgical operation. All patients have been premedicated with atropine 0.01mg/kg and midazolam 0.015 mg/kg 10 min before the cutaneous infiltration, and analgesia has been obtained by sufentanil administered as i. v. infusion at an initial rate of 0.5 micrograms/kg/min for 30-60 sec. before local anaesthesia. After the anaesthetic blockage, infusional rate was reduced to 0.05 micrograms/kg/min because of hypoventilation risk. About 8 10 min before talc nebulization an additional dose of midazolam 0.015-0.02 mg/kg and sufentanil 0.1-0.2 micrograms/kg was infused. Drugs and equipment for general anaesthesia were always available in the operating room. ABG analysis was carried out before and after surgery and 6 hours after dismissal from the Post-Anaesthesia Care Unit. The patient layed in lateral and half seated position, using lateral supports for pelvis and arms. The introduction of the video-thoracoscopy was chosen on the sidewall of the

Table 1. Pathology

Breast cancer	29
Lung cancer	24
Extra-thoracic cancer	20
Ovary	2
Prostate	2
Stomach	1
Colon	3
Urogenital system	3
Uterus	1
Lymphomas	4
Adenocarcinoma unknown	4

Table 2. Complications (%)

Hypotension	33.6
Respiratory depression	9.0
A.R.D.S.	0.5
Nausea	18.0
Vomiting	6.0
Pruritus	6.0
Pain moderate or severe	6.0
Fever	4.5

thorax by indications of TC scan of the thorax. Pleural space was approached through a single thoracoporth 10.5 or 11.5 mm diameter, using a bayonet videothoracoscopy in order to show the pleural space for execution of the biopsies and nebulization of the talc for pleurodesis. Before nebulization all effusion was slowly sucked. The dose was between 3 and 6 grams of talc without asbestos (Steritalc) directed to obtain a homogeneous distribution. All patients with Sa O₂ <90% were controlled by O₂ Venturi mask. Not important intraoperative complications neither mortalities have been had, while those post-operative ones are listed in the table 2. Chest X-ray was performed in all patients in order to check both the complete expansion of the treated lung and the presence of pneumothorax or residual pleural effusion. The water-drainage was removed in 3.2 days (2-11 days) generally when a loss of liquid <100 ml per day was achieved. We considered a complete effectiveness of the treatment when the 30 and 90 days X-ray control revealed absence of effusion, while a partial result was the presence of liquid (<500 ml) without dyspnoea (7). Only forty-two patients completed the two steps follow-up control after three months, while we missed 3 patients for death due to cancer disease and 5 for progression of malignant disease or co-morbidity.

Discussion and results

We didn't observed serious complications to the treatment of talc pleurodesis by V.A.T.S. except a case of A.R.D.S. treated with medical therapy alone (8). The effectiveness of the procedure was complete in the 65% of patients, partial but valid in 24% for a total of 89% of the cases. In a case we repeated the talc pleurodesis by V.A.T.S. because the patient was in

good general conditions. In another patient with bilateral effusion from breast cancer, we carried out V.A.T.S. in both sides, distanced two weeks one from another. Our experience is similar to that of other Authors in international literature. A reduced number of patients (approximately 6%) at a distance of six months from the procedure complained of paraesthesias, as feeling pins and needles at thoracic wall or absence of sensibility around the surgical wound. The procedure has been revealed effective, similar to that one obtained in the patients in inferior age with reduced incidence of complications. Some years ago the technique was performed under general anaesthesia using a double lumen endotracheal tube. The one lung ventilation guaranties an excellent visibility to the surgeon but it causes a forced shunt through the other lung which is no more ventilated but still perfused with an increase of 20–50% of shunt rate. In this way the gas exchange could be compromised. Often patients suffering from pleural malignant effusion are also affected by chronic obstructive pulmonary disease, with alterations of reflex hypoxic pulmonary vasoconstriction, for this reason the choice of anaesthetic drugs requires a particular care. The possibility to execute it in local anaesthesia and neuroleptanalgesia diminishes a lot the operating risks being all these patients in class ASA III-IV. The M.A.C. technique, drugs with rapid onset time, short action absence of cumulative effects, rapid recovery time and minimum side effects are used. Various anaesthetics agents, many of which use the association of an opioid agent and a benzodiazepine, can perform MAC. This technique allows a minimum level of loss of consciousness that patient maintain a continuous and independent respiratory capacity, and respond adequately to verbal and physical incitation. The effectiveness of the talc pleurodesis, recognized from more than a decade all over the world, the low cost of the substance, the easy procedure concur to dealing the great part of patients. Since the limited expectation of life and a compromised general condition represents in practice the only real contraindications, it is favourable that such procedures were proposed in a premature phase of the pleural disease in order to obtain better results and to elevate the quality of life of these patients.

Conclusions

The talc pleurodesis executed in the old patients (>70 years) by means of the V.A.T.S. “one trough” and “Monitored Anaesthesia Care” (MAC) has shown valid procedure for the control of the secondary neoplastic pleural effusion, with little uneasiness for the patients, reduced complications and a sure effectiveness. Today drainage of the effusion by serial pleurocentesis without pleurodesis is only considered appropriate for terminally ill patients. However a treatment in a more premature phase seems favourable.

References

1. Dresler CM, Olak J, Herndon JE 2nd, et al. Phase III intergroup study of talc poudrage vs talc slurry sclerosis for malignant pleural effusion. *Chest* 2005; 127 (3): 909-15.
2. Ukale V, Agrenius V, Widstrom O, Hassan A, Hillerdal G. Inflammatory parameters after pleurodesis in recurrent malignant pleural effusions and their predictive value. *Respir Med* 2004; 98 (12): 1166-72.
3. Haddad FJ, Younes RN, Gross JL, Deheinzelin D. Pleurodesis in patients with malignant pleural effusions: talc slurry or bleomycin? Results of a prospective randomized trial. *World J Surg* 2004; 28 (8): 749-53.
4. Ohm C, Park D, Vogen M, et al. Use of an indwelling pleural catheter compared with thoracoscopic talc pleurodesis in the management of malignant pleural effusions. *Am Surg* 2003; 69 (3): 198-202.
5. Gravino E, Griffo S, Gentile M, Storti M, Grossi N, Gily B. Comparison of two protocols of conscious analgesedation in video-assisted talc pleurodesis. *Minerva Anesthesiol* 2005; 71 (4): 157-65.
6. Paull DE, Delahanty TJ, Weber FJ, Harostock MD. Thoracoscopic talc pleurodesis for recurrent, symptomatic pleural effusion following cardiac operations. *Surg Laparosc Endosc Percutan Tech* 2003; 13 (5): 339-44.
7. Gill AJ, Mathur MN, Tattersall SF. Systematic response to talc pleurodesis. *Am J Respir Crit Care Med* 2004; 169 (9): 1074.
8. Hirota B, Nguyen MM, Irimajiri S, Choi J, Tokeshi J. Severe hemorrhagic complication of talc pleurodesis for idiopathic pleural effusion. *Hawaii Med J* 2004; 63(7): 208-10 (Abstract).

