Bronchoscopic cryotherapy for advanced bronchial carcinoma

We were interested to read the paper by Dr D A Walsh and colleagues on bronchoscopic cryotherapy (July 1990;45:509–13). At a time when laser therapy is widely practised, their report provides a useful reminder that other, less costly, methods exist for debulking tumour from the upper airways. We would, however, like to question some of their conclusions.

Firstly, we suspect that the authors are overstating their case when they claim that the results of cryotherapy compare favourably with those obtained with the laser. In consecutive series of patients treated with the laser we have observed significant improvements in both lung function and breathlessness scores. In the study by Dr Walsh and colleagues significant improvements in indices of lung function were not seen, and changes in dyspnoea scores were apparently assessed with an inappropriate statistical test (the paired Student's *t* test). As breathlessness scores are measured on an ordinal scale, non-parametric statistical tests are more suitable. The authors also claim that their results for treating lung collapse (successful re-expansion in 24% of patients) are similar to those obtained with the laser. Our recent experience, however, suggests that the results of laser therapy are substantially improved (successful re-expansion in 80% of patients) when treatment is combined with bronchography.[1] Although it is difficult to compare independently obtained results, it might be argued that the results of cryotherapy are not as good as those of the laser.

Secondly, the authors claim that cryotherapy has the advantage of requiring a shorter general anaesthetic than the laser. It should be appreciated, however, that cryotherapy requires several treatments over a six week period and that each treatment requires a separate anaesthetic and hospital admission. We do not think that this is an ideal palliative treatment for a patient with a limited life expectancy. Although laser treatment may be relatively time consuming, optimal airway clearance is almost always obtained with one treatment, allowing the patient to remain at home until relapse. The ability to clear large quantities of tumour from the airway with the laser also ensures that symptomatic and functional improvements are rapid. Patients with tumours affecting the trachea and main carina are often in extreme respiratory distress at the time of referral and usually derive immediate and dramatic relief from laser therapy.[3] It is doubtful whether cryotherapy could provide the same rapid effect.

Finally, it is claimed that cryotherapy is associated with fewer complications than laser therapy. This statement is difficult to substantiate in view of the small number of patients treated with cryotherapy. Nevertheless, if one accepts that this is correct, it could still be argued that the increased risks of laser therapy are more than offset by the striking clinical benefits of treatment.

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2 George PJM, Garrett CPO, Hetzel MR. Role of the neodymium YAG laser in the management of tracheal tumours. *Thorax* 1987;42:440–4.

AUTHORS' REPLY We welcome the comments of Drs George and Rudd. Our paper was primarily concerned with reporting our experience of bronchoscopic cryotherapy. We found a significant improvement in dyspnoea score after cryotherapy ($p < 0.05$, Wilcoxon's signed rank test). Fifty eight per cent of patients had improvement in at least one measure of lung function and these changes correlated with changes in dyspnoea and exercise tolerance. In our relatively unselected group of patients, most of whom had coexistent chronic airflow limitation and many of whom had an extrabronchial component to their obstruction, we were not surprised to find no overall improvement in any one measure of lung function. The papers of Drs George and Rudd refer to laser therapy in highly selected groups of patients and it would be inappropriate to directly compare their results with ours.

Although we routinely give a course of three treatments with cryotherapy, each period under anaesthetic is less than 15 minutes and the patient usually returns home within 24 hours. Most patients experience overall subjective improvement after a single cryotherapy and the progressive and sustained improvement with three planned and brief treatments over six weeks provides good palliation. We note that even in the most recent paper of Dr George and colleagues quoted above four of the 15 patients selected for laser therapy required more than a single treatment. Hetzel *et al* have previously remarked on the problems associated with prolonged intravenous anaesthesia in patients treated with laser.[1]

Our experience of cryotherapy now extends to over five years and we treat, on average, five new patients a month. The very low incidence of adverse effects reported in our published series is in no way atypical. It would require randomised, comparative studies to determine accurately the relative merits of cryotherapy and laser therapy. Meanwhile we believe that both treatments have a place in the palliative management of these patients.

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1 Hetzel MR, Nixon C, Edmonstone WM, *et al.* Laser therapy in 100 tracheobronchial tumours. *Thorax* 1985;40:341–5.

Tests giving an aetiological diagnosis in pulmonary disease in patients infected with the human immunodeficiency virus

In their review of the investigation of pulmonary disease in patients infected with HIV (January 1990;45:62–5) Dr Miller and colleagues propose that use of the technique of inducing sputum can be justified only in centres caring for large numbers of patients with AIDS. We report our experience, suggesting that the technique can be successfully used in centres with small numbers of HIV positive patients.

Nine HIV positive patients presenting consecutively in the last year with acute respiratory episodes suggestive of *Pneumocystis carinii* pneumonia underwent sputum induction performed by our ward physiotherapist with a Mistogen EN145 ultrasonic nebuliser.[1,2] The immunofluorescent antibody test for *Pneumocystis carinii* (Public Health Laboratory in house method) gave a positive result in six patients, all of whom responded to anti-pneumocystis treatment. *Pseudomonas aeruginosa* and *Haemophilus influenzae* were isolated from induced sputum in two patients who responded to appropriate antibiotics. One patient was unable to tolerate the procedure. He had fulminant pneumonia that responded to intravenous pentamidine.

We had less success in the preceding year. Five HIV positive patients presenting with acute respiratory episodes suggestive of pneumocystis pneumonia underwent sputum induction performed by various ward staff, using a System 22 Acorn nebuliser. Specimens were stained with the Grocott methanamine silver stain for *Pneumocystis carinii* and all were negative. In three patients brochoalveolar lavage performed within 48 hours of sputum induction was positive for *Pneumocystis carinii*. The other two patients had pneumococcal infections.

We attribute our improved results with induced sputum to the interest of our ward physiotherapist, careful adherence to the protocol, use of an ultrasonic nebuliser and the immunofluorescent antibody test for *Pneumocystis carinii*.[3] Although time and effort have been required to achieve success, it has resulted in the easier management of our last nine patients. Sputum induction can be used in centres with low numbers of HIV infected patients.

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1 Bigby TD, Margolskee D, Curtis JL, *et al.* The usefulness of induced sputum in the diagnosis of *Pneumocystis carinii* pneumonia in patients with the acquired immunodeficiency syndrome. *Am Rev Respir Dis* 1986;133:515–8.
2 Leigh TR, Parsons P, Hume C, Husain OAN, Gazzard BG, Collins JV. Sputum induction for the diagnosis of *Pneumocystis carinii* pneumonia. *Lancet* 1989;ii:205–6.
3 Kovacs JA, Ng VL, Masur H, Leoung G, *et al.* Diagnosis of *Pneumocystis carinii* pneumonia: improved detection in sputum with use of monoclonal antibodies. *N Engl J Med* 1988;318:589–93.

AUTHORS' REPLY We are delighted to read that Dr Parry and his colleagues have obtained successful results with sputum induction for the diagnosis of respiratory episodes in HIV positive patients. The point we hoped to make in our article was that the time, effort, interest (for example, of dedicated physiotherapists or nursing staff), and expense (further increased by the use of monoclonal antibodies) of sputum induction would be justified in most centres only if large numbers of procedures were being carried out. This does not mean to say that centres with personnel who have particular skills and enthusiasm will not produce good results despite a low case load.

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Thorax: first published as 10.1136/thx.46.2.150-b on 1 February 1991. Downloaded from http://thorax.bmj.com/ on April 19, 2024 by guest. Protected by copyright.