



## Editorial

### Old Methods, New Applications

#### Antiguos métodos, nuevas aplicaciones

Andrés Cosano Povedano

Unidad de Broncoscopia Intervencionista, Servicio de Neumología, Hospital Universitario Reina Sofía, Córdoba, Spain

Cold has been used for many centuries to treat pain and inflammation. In pneumology, the application of cold for haemostasis is certified for bleeding injuries, whether spontaneous in nature or provoked by invasive endobronchial procedures. More recently, in the 1980s, the Mayo Clinic developed the use of cryoprobes to treat tracheobronchial-obstructing tumour lesions.<sup>1</sup> However, this technique was put into question with the introduction of the Nd:YAG laser that achieved the same result with a single treatment session.<sup>2</sup> For this reason, some bronchoscopy intervention units have left cryotherapy as a secondary option to techniques such as laser and electrocauterization.

We know that traditional cryoprobes cause tissue freezing by cellular dehydration and the formation of ice crystals that, following successive therapeutic applications, cause tissue destruction. It has been used to eliminate granulomas and main airway tumours, although, as previously mentioned, the effects of this treatment are slow, requiring repeated endoscopic explorations for debridement of the treated tissue. However, technical research has produced more efficient probes that can achieve temperatures at the metallic tip up to -89° C. On the other hand, the flexibility of a probe permits its use through the working channels of the therapeutic bronchofibroscopy.

Another effect of cold is adhesion of the cryoprobe point to porous tissues, creating an important traction effect that allows extraction of foreign bodies and literally rips off portions of tissue.<sup>3</sup> This effect has also been used to rapidly unblock tumours from the main airway, and is just as efficient as the use of a rigid bronchoscopy following laser photocoagulation; this new technique for using cold is called cryocalorization.<sup>4</sup>

Diffuse interstitial pulmonary illnesses are a group of processes with a very similar clinical, radiological, and functional presentation, but with distinct prognostic implications. At present, the diagnostic approach includes assessment of the previously mentioned factors, along with a study of the cellularity of the bronchoalveolar lavage<sup>5</sup> and histological exam, whenever these are considered necessary and the clinical and functional state of the patient permits it.

To date, the steps for obtaining pulmonary tissue samples for diagnosis are transbronchial biopsies and, as a second step in cases where the diagnosis is unconfirmed, obtaining wedges of pulmonary tissue by minithoracotomy or video-assisted thoracoscopy.<sup>6</sup> Diagnoses derived from surgical biopsies provide the highest payoff,<sup>7</sup> although transbronchial biopsy provides a higher efficiency for granulomatous illnesses than for interstitial pulmonary fibrosis. However, surgical techniques imply greater economic costs and, in the case of a pertinent functional impact, a greater level of risk for the patient. On the other hand, the possibility exists that the diagnostic procedure might reactivate the subjacent inflammatory process.<sup>8</sup>

In the present number of *Archivos de Bronconeumología*, an interesting prospective study has been published that compiles the experiences of the Bronchoscopy Unit at the Pneumology Department of the Santa Cruz and San Pablo Hospital of Barcelona. Pajares et al<sup>9</sup> used an old method with a new application for patients with diffuse interstitial pulmonary illnesses by obtaining pulmonary tissue by cryoprobe through a video-assisted bronchoscopy while the patient is under deep sedation. The results were very positive, due to the high production of samples, the low economic costs of the procedure, and the low number of complications associated with this technique.

In the future, once a greater number of cases, and thus experience, has been reached, the technical complexity of this procedure can be reduced, that is, the need for an orotracheal intubation, deep sedations, and an operating theatre. The possibility of performing this procedure in a conventional bronchoscopy room is an achievable goal.

Here we must underline that this technique widens the possibility of studying illnesses in which pulmonary biopsies are required for an adequate diagnosis, including other inflammatory, infectious, and neoplastic processes with extensive pulmonary damage.

In summary, Pajares et al<sup>9</sup> contribute an important work that opens new expectations for resolving the frequent problem of obtaining parenchymal samples for assessment of diffuse illnesses; in these, transbronchial biopsies do not lead to definitive diagnoses,

and surgical biopsies produce higher morbidity and mortality and economic costs.

## References

1. Mathur PN, Wolf KM, Busk MF, Briete WM, Datzman M. Fiberoptic bronchoscopic cryotherapy in the management of tracheobronchial obstruction. *Chest*. 1996;110:718-23.
2. Hetzel J, Hetzel M, Hasel C, Moeller P, Babieak A. Old meets modern: The use of traditional cryoprobes in the age of molecular biology. *Respiration*. 2008;76:193-7.
3. Bonniot JP, Homasson JP, Roden SL, Angebault ML, Renault PC. Pleural and lung cryobiopsies during thoracoscopy. *Chest*. 1989;95:492-3.
4. Hetzel M, Hetzel J, Schumann C, Marx N, Babiak A. Cryorecanalization: A new approach for the immediate management of acute airway obstruction. *J Thorac Cardiovasc Surg*. 2004;127:1427-31.
5. Jara-Palomares L, Martín-Juan J, Gómez-Izquierdo L, Cayuela-Domínguez A, Rodríguez-Becerra E, Rodríguez-Panadero F. Hallazgos en el lavado broncoalveolar de pacientes con enfermedad pulmonar intersticial difusa. Estudio de una cohorte prospectiva de 562 pacientes. *Arch Bronconeumol*. 2009;45:111-7.
6. American Thoracic Society/European Respiratory Society. Idiopathic pulmonary fibrosis: Diagnosis and treatment. International consensus statement. *Am J Respir Crit Care Med*. 2000; 161: 646-4.
7. Morell F, Reyes L, Domenech G, de Gracia J, Majó J, Ferrer J. Diagnósticos y procedimientos en 500 pacientes consecutivos con sospecha clínica de enfermedad pulmonar intersticial. *Arch Bronconeumol*. 2008;44:185-91.
8. Bando M, Ohno S, Ozono T, Yanase K, Sato Y, Sohara Y, et al. Risk of acute exacerbation after video-assisted thoracoscopic lung biopsy for interstitial lung disease. *J Bronchol Inter Pulmonol*. 2009;16:229-35.
9. Pajares V, Torrejo A, Puzo C, Lerma E, Gil M.A, Franquet T. Utilización de criosondas para la realización de la biopsia pulmonar transbronquial. *Arch Bronconeumol*. 2010;46:111-5.