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Editorial

The Increasing Technology in Bronchoscopy Suites

Tecnificación de los gabinetes de endoscopia respiratoria

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I imagine that if any of our ancestors were to wake up and we let them in to the living room of our houses, they would be amazed at the amount of new technological appliances that have taken up the living space which was previously devoted to reading, sewing, talking, playing cards etc. Slowly but surely, living rooms of the past were occupied by transistor radios around which families would meet to listen to the news, music or a series similar to the television series we watch today. Later, televisions started to appear, first in black and white and then in colour. And in this way, our houses have been filled with new technology.

Something similar has occurred in the bronchoscopy rooms of our hospitals. If we go back to the origins of bronchology, the equipment in treatment rooms was limited to a rigid bronchoscope and at best a rigid thoracoscope. The techniques allowed the direct observation of the tracheobronchial tree and pleura respectively, which made it possible to extract foreign bodies, aspirate secretions and distinguish a healthy mucosa from a pathological one.[1,2]

Rigid bronchoscopes got better and better, with each school developing its own: Dumon instruments in France and Storz or Richard-Wolf instruments in Germany.[3] At the same time, new techniques were introduced such as broncheoalveolar lavage, the endobronchial instillation of medication, treatment with brachytherapy and transbronchial lung biopsies. One of the greatest technological advances in the field of bronchoscopy came in 1967 when Shigedo Ikeda, with the help of Machida-Toshiba and Olympus, designed the first flexible bronchoscope,[4] which meant improved visualization of the tracheobronchial tree (before this time access beyond the segmental bronchi was not possible) and advances in terms of ease of use and better tolerance. The subsequent appearance of the videobronchoscope brought about new advantages, further improving the field of vision and image quality. Cave paintings highlight human being's imperious need to record and save images of the interesting things that we see. The same was true of bronchoscopists, whose desires were met when technology equipped them with apparatus enabling them to take high-quality photographs and films of lesions observed in the tracheobronchial tree.[1,4]

However, the path to providing bronchoscopy rooms with technology is not easy, as many obstacles have to be overcome, amongst which is the big economic investment which has to be made both in terms of equipment and staff. Some European countries such as Germany or France began adapting former tuberculosis clinics to the modern times of pneumology without needing to make big investments, amongst other reasons because they already had the necessary equipment and trained staff. Both countries have been pioneers in forming interventional pulmonology units, examples of this being the Lungenklinik hospital in Hemer, the Thoraxklinik hospital in Heidelberg or the Santa Margarita hospital in Marseille. While in Spain there was a real revolution in cardiology and digestive endoscopy rooms, in bronchoscopy rooms the technical equipment became obsolete, partly due to oversights by our hospital managers and partly because there was no awareness of endoscopy in many centres. Only certain hospitals in Madrid, Barcelona or Cordoba lived through the revival of the rigid bronchoscope at the same time as acquiring new diagnostic and therapeutic endoscopy instruments such as cryotherapy equipment, argon-plasma coagulators, and/or different types of lasers.[5-7]

Although every interventional pulmonology unit has its own characteristics, there are international recommendations of their composition.[8-10] An interventional pulmonology unit consists of a predefined physical space composed of technical equipment and a team of staff which must include well-trained bronchoscopists, anaesthesiologists and specialized nurses. Once again we encounter teamwork. This teamwork demands skills that have been acquired throughout one's life. Here, the unit does not function as an individual but rather as a centre, where installations, resources and a team of staff, known in some European countries as an endo-team, come together.

When providing a bronchoscopy room with technology and before purchasing any equipment, a detailed study should assess whether this is economically viable, taking into account general expenses (including the physical space or the resuscitation equipment), expenses for consumable goods (e.g. drugs and disposable instruments) and personnel expenses (salaries).[8-10] The next step should establish the profit-volume, that is, the number of procedures which must be performed to cover the costs of providing an interventional bronchoscopy department.[9,10] Regarding the

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installations and the team, an interventional bronchoscopy unit must be established according to the needs of the local population and take into account the most common pathologies/diseases, the characteristics of the hospital and the resources available.[8-11] This means that a special unit may not be practical in all medical centres. A great deal of controversy has been aroused regarding whether all bronchoscopy units should offer all the techniques existing on the market and have the trained staff to perform them. In principle, first and second-level hospitals should be provided with a traditional diagnostic and therapeutic bronchoscopy department, if possible complemented with rigid bronchoscopy, leaving more complex techniques for third-level hospitals, where there are more highly-trained staff to perform them. Purchasing basic equipment for an interventional pulmonology department is based on financial considerations and the population attended to in each centre.[9] Therefore, the main interventional procedures, such as the canalization of endobronchial lesions, laser treatment or stent placements, should be concentrated in specific medical centres as it is impossible for every hospital to have all the necessary installations, equipment and trained staff to carry out every procedure and handle possible complications that could arise.[8-10] In any case, these must be carried out in a centre where patients can be looked after correctly, where samples obtained can be handled suitably and where a fast and appropriate response can be provided in an emergency.

However, everything stated above about providing technology for bronchoscopy rooms makes no sense if they do not have a staff able to use these tools and deal with complications that may arise at a later stage. Regarding the endo-team, European and American guidelines[8-12] recommend forming a well-trained team which should be familiar with the procedures performed and the handling of samples in order to make the most of the tests and to provide optimal comfort and safety for the patients. The European guidelines also recommend that at least 1-2 trained nurses are present during interventional pulmonology procedures. If the procedures are carried out under general anaesthetic, the team must also have an anaesthesiologist and specialist nurses. In our country, the SEPAR guidelines[11] recommend having at least 2 nurses and 2 bronchoscopists on the team as, if interventional treatment is offered, it must be available 7 days a week. If there is only one trained bronchoscopist, it is important that there is an interventional pulmonology team nearby in case one of the team takes sick leave or it is necessary to fill a vacancy on the team.

Technological improvements in bronchoscopy rooms have lead to advances and advantages for patients, doctors and hospitals. For patients, it has implied obtaining a faster and/or more accurate diagnosis, and thus they receive better treatment which could improve their symptoms and maybe even survival rates. Doctors can offer a bigger range of diagnostic and therapeutic techniques with a greater safety margin since, for example, faced with haemoptysis after recanalization treatment, they can use haemostasis techniques.[13,14] Having the right techniques and duly trained staff, services which were unthinkable before, can be organized and given in such a way that patients are in the hands of experts and they receive better treatment. All this benefits the hospital in the long term since, despite the substantial initial investment, it implies an optimization of resources and savings in healthcare expenses as, among other advantages, the procedures can be performed in an endoscopy room and not in the operating theatre. Furthermore, the techniques can be carried out in the outpatient clinic, and also the fact that they are performed by experts implies avoiding them having to be repeated or having to perform more aggressive techniques, as has occurred in the last decade with mediastinoscopy since the introduction of endobronchial ultrasound.[15,16]

Therefore, in recent years we have experienced great technological progress, seeing how the rigid bronchoscopes in our bronchoscopy rooms started to be replaced unfortunately by flexible bronchoscopes and then by flexible videobronchoscopes. And I have written unfortunately because I consider that it was a real pity that there was no transfer of knowledge between generations, an exchange of information between the old and the new, which is not synonymous with antiquated and immature, but rather wisdom and experience combining very well with the hopes and strength of youth. However, thanks to the effort, work and determination of the bronchoscopists in our country, Spain is present once again in prestigious journals publishing high-quality research related to diagnostic and/or therapeutic bronchoscopy.[2,5-7,17-20]

I shall finish this editorial in which I have hoped to show you the route taken in recent years to provide technology, on one of the most beautiful paths of our speciality, the trip through the bronchi. This allows us to observe and make new endobronchial discoveries, and to diagnose and treat these lesions and even see beyond the bronchial wall with the help of endobronchial ultrasound. I would like to propose something which at times we forget, and that some of my teachers in this speciality and in life have taught me - the transfer of knowledge between generations. I believe that no pulmonologist/chest surgeon who knows how to perform rigid bronchoscopy or thoracoscopy should be allowed to retire without first leaving a legacy. The excessive fear of being substituted together with the lack of high-quality working contracts which consolidate those who have something to teach has lead us to put teaching to one side, casting into oblivion techniques such a rigid bronchoscopy in most medical centres in this country. Likewise, in some European centres they have stopped performing techniques such as blind pleural biopsies in favour of thoracoscopies. Confrontations between techniques are not necessary as each one has its indications. None of them should fall into oblivion again, except those whose use has not brought about any objective progress or when other new techniques or treatments have obtained better results. Finally, it is worth highlighting that new technology in bronchoscopy rooms is and will be senseless if there is not a good team of professional staff to make use of it.

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