

## Editorials

## Video-assisted thoracoscopic surgery (VATS) in the management of spontaneous pneumothorax

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Spontaneous pneumothorax is a disease of the pulmonary parenchyma, not of the pleura, in which patients present in a bimodal distribution – young patients with an isolated apical bleb or bulla (primary pneumothorax) and elderly patients with multiple emphysematous bullae (secondary pneumothorax). The primary element in surgical management of the condition is to control the source of the air leak. Although acceptable results are obtained by bullectomy alone,<sup>1</sup> pleurodesis is generally attempted to guard against missed bullae or the future development of more bullae.

In this issue of *Thorax* Tschopp *et al*<sup>2</sup> describe a technique for treating spontaneous pneumothorax using video-assisted thoracoscopic surgery (VATS) under local anaesthetic to perform talc insufflation without any attempt to control the air leak directly. Most of their patients were treated for recurrent pneumothorax with a median time to resolution of five days. Their initial treatment failure rate was 10% with a late recurrence rate of 7.5%. These results do not compare favourably with the results of surgical bullectomy and pleurodesis which has a recurrence rate of below 1%.<sup>3</sup> Indeed, simple chest drainage alone is associated with comparable resolution rates varying from 82% after 48 hours,<sup>4</sup> with a median resolution time of three days in 80% of patients with primary pneumothorax increasing to nine days in patients with underlying lung disease.<sup>5</sup> However, additional talc pleurodesis does produce less recurrence than simple drainage alone.<sup>6</sup>

There are several technical concerns associated with VATS under local anaesthesia supplemented by nitrous oxide inhalation. These arise from the inability to obtain isolated single lung ventilation and include difficulties in inspecting the entire visceral pleural surface (increasing the risk of missing a leaking bulla) and in manipulating the underlying lung (increasing the likelihood of iatrogenic parenchymal air leakage). The anaesthetic technique involving the use of intravenous opiates and benzodiazepines has cardiorespiratory side effects which could lead to problems in patients with secondary pneumothorax, both during surgery and in the recovery period. There is also a potential danger in using nitrous oxide in patients with a residual pneumothorax as the rapid diffusion of nitrous oxide may double the size of the pneumothorax in less than 10 minutes.<sup>7</sup>

One also has concerns about the consequences of repeated thoracoscopy under local anaesthetic as reported by Tschopp *et al*. Repeated talc pleurodesis would make subsequent video-assisted thoracoscopic surgery less likely to succeed in controlling a persistent air leak due to the likely formation of patchy adhesions. In addition, un-

necessarily prolonged or repeated intercostal drainage increases the likelihood of pleural sepsis, adhesions, formation of a visceral cortex, and the need for thoracotomy.<sup>8</sup>

The patient population described by Tschopp *et al* may not be typical of experience in other countries. They report only 17% of patients to have bullae of more than 2 cm diameter (lower than my personal experience of video-assisted thoracoscopic bullectomy in which bullae of this size occurred in over 90% of cases) which may reflect a deficiency in their intrathoracic inspection with spontaneous double lung ventilation. Their indications for video-assisted thoracoscopic surgery, with 84% of patients presenting with recurrent spontaneous pneumothorax and only 16% with a persistent air leak, are also different from our experience where recurrent and persistent pneumothorax were equally common presenting conditions.<sup>9</sup>

“Medical” thoracoscopy is a term used only to be condemned since video-assisted thoracoscopic surgery should not be attempted by any practitioner not experienced in general open thoracic surgery.<sup>10</sup> Without general anaesthesia it may have a limited role in the assessment of patients with a first-time spontaneous pneumothorax, directing them towards appropriate treatment (drainage or video-assisted thoracoscopic surgery<sup>11</sup>) but, as described by Tschopp *et al*, it is an inferior treatment modality. A single effective procedure is required and the gold standard against which others must be judged is surgical bullectomy and parietal pleurectomy.<sup>3</sup> While video-assisted thoracoscopy may reduce the trauma of open surgery and result in less respiratory dysfunction,<sup>9</sup> its use must not compromise the basic surgical method. After an initial learning process reliable results can now be obtained from video-assisted thoracoscopic bullectomy and parietal pleurectomy (a personal recurrence rate of 3%) and it should be recommended as the treatment of choice for spontaneous pneumothorax.

Video-assisted thoracoscopic talc pleurodesis under local anaesthesia may seem attractive in high risk emphysematous patients but is arguably inferior to either video-assisted thoracoscopic bullectomy under general anaesthesia, which we have found to be well tolerated,<sup>12</sup> or to prolonged chest drainage with a flutter valve.<sup>13</sup> This method avoids the risks of anaesthesia and allows the intrapleural administration of sclerosants such as talc or tetracycline, thus accomplishing what Tschopp *et al* have done with considerably less fuss.

The development of reliable video-assisted thoracoscopic surgery for spontaneous pneumothorax should provoke a review of the current indications for surgical referral,<sup>14</sup> particularly as preoperative delay may prejudice the

outcome. Referral after a second spontaneous pneumothorax or a persistent air leak of over two days in the young or seven days in the elderly is advocated. The role of video-assisted thoracoscopic surgery after first time pneumothorax remains to be evaluated but its use without general anaesthesia has no recognised place at present in UK thoracic surgical practice.

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