Commentary on Thoracic Surgery

Commentary on the article "Radioguided video-assisted resection of non-palpable solitary pulmonary nodule/ground glass opacity: how to do it"

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Comment on: Bertolaccini L, Salgarello M, Gorgoni G, *et al.* Radioguided video-assisted resection of non-palpable solitary pulmonary nodule/ground glass opacity: how to do it. J Vis Surg 2015;1:9.

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The article describes the radioguided localization technique of small lesions (maximum nodule diameter <15 mm, distance from the nearest pleural surface of 20–40 mm) or ground glass opacities (GGO) to identify and resect them by video-assisted thoracoscopic surgery (VATS) (1). This technique enables the possibility of using the VATS approach in order to localize lesions, which are often too small to be recognised by digital palpation, and which would otherwise require a thoracotomy for diagnostic purposes. First step is the CT-guided injection of a solution of ^{99m}technetium macro-aggregate albumin diluted with iodized contrast medium. This allows the stability of the radiotracer in the lung for up to 18 hours for an optimal planning of the surgical resection. A CT scan was performed to confirm the precise staining. Then a VATS with three ports was performed and the gamma detector was inserted inside the chest to localize the tracer and the parenchyma was grasped in its correspondence. After a double check of the tracer's position with the gamma detector, the resection was performed and the sample was sent for histologic examination (frozen section). In case of diagnosis of lung cancer, a VATS lobectomy was performed.

This technique is associated with a very good success rate, low morbidity and zero mortality. This is also confirmed by other studies with large cohorts of patients. Galetta *et al.* (2) had 112 patients undergo a preoperative radiotracer injection. Pulmonary resection was performed by VATS in 70 patients, thoracotomy in 36 patients and conversion of VATS to thoracotomy in 6 patients. They experienced some adverse events as pneumothoraces (only one requiring chest tube placement), parenchymal haemorrhage suffusions and one case of allergic reaction to contrast medium.

Ambrogi *et al.* (3) had 211 patients undergoing VATS with radio-guided technique. The procedure was successful in 208/211 cases, only three patients required conversion to a mini-thoracotomy. Some pitfalls have been experienced but have been overcome. The first pitfall was the outsized diffusion of the radiotracer inside the lung parenchyma in case of bullous emphysema adjacent to the nodule, which could lead to a wider area of radioactivity and reduce the precision of the resection. This is the reason why bullous emphysema around the targeted lesion may be considered as a contraindication for this technique.

The second pitfall, also described from Grogan *et al.* (4), is the spillage of the radiotracer into the pleural space in case that the tracer is injected near the pleural surface of a major fissure or if a pneumothorax develops during the injection. This increases the ground radioactivity and prevents the correct localisation of the nodule/GGO, even if the tracer was correctly injected within the nodule. To overcome this problem, a CT scan post injection should always be performed in order to check the localisation of the radiotracer (which should contain a small amount of

non-ionic contrast material, so that the contrast material can be seen on the CT scan). If necessary, a second injection is performed. Another strategy is to repeatedly wash the pleura with saline solution during the VATS to reduce pleural ground radioactivity.

In comparison with other methods of localization of small nodules, the radio-guided technique is the preferable method because of its high accuracy with minimal complications and minimal operator dependence in detecting subcentimeter nodules or GGOs when compared to other techniques such as ultrasonography, finger palpation, fluoroscopic, hook-wire, spiral-wire and microcoil localisation (5).

As Grogan *et al*. (6) assessed in their study, the radiotracer-guided thoracoscopic resection is a cost-effective technique ($27,887 *vs*. $32,271 for thoracotomy). Moreover the gamma detector is the same device used in the widespread sentinel lymph node technique in breast cancer surgery and is therefore available in most centres.

In conclusion, the radioguided video-assisted resection for small lung nodules or GGO is the most cost-effective, sensible, non operator dependant technique, which is associated with less complication and higher success rates in localize and remove the nodules/GGOs compared to other methods.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Bertolaccini L, Salgarello M, Gorgoni G, et al. Radioguided video-assisted resection of non-palpable solitary pulmonary nodule/ground glass opacity: how to do it. J Vis Surg 2015;1:9.
2. Galetta D, Bellomi M, Grana C, et al. Radio-Guided Localization and Resection of Small or Ill-Defined Pulmonary Lesions. Ann Thorac Surg 2015;100:1175-80.
3. Ambrogi MC, Melfi F, Zirafa C, et al. Radio-guided thoracoscopic surgery (RGTS) of small pulmonary nodules. Surg Endosc 2012;26:914-9.
4. Grogan EL, Jones DR, Kozower BD, et al. Identification of small lung nodules: technique of radiotracer-guided thoracoscopic biopsy. Ann Thorac Surg 2008;85:S772-7.
5. Zaman M, Bilal H, Woo CY, et al. In patients undergoing video-assisted thoracoscopic surgery excision, what is the best way to locate a subcentimetre solitary pulmonary nodule in order to achieve successful excision? Interact Cardiovasc Thorac Surg 2012;15:266-72.
6. Grogan EL, Stukenborg GJ, Nagji AS, et al. Radiotracer-guided thoracoscopic resection is a cost-effective technique for the evaluation of subcentimeter pulmonary nodules. Ann Thorac Surg 2008;86:934-40; discussion 934-40.

