How-to-do-it

Mediastinoscopy and permanent venous access device positioning through the same incision

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Abstract

We report herein our technique for positioning of permanent venous access device in patients undergoing mediastinoscopy for diagnosis and/or staging of thoracic malignancies. Through the same 3-cm skin incision employed for mediastinoscopy, access to right internal jugular vein is obtained and the prepectoral pocket for chamber positioning is prepared. The technique is simple, safe and provides increased patient acceptability.

Keywords: Mediastinoscopy; Venous access device; Technique; Chemotherapy; Lung cancer

1. Introduction

In cancer patients central venous system access is often required to administer chemotherapeutic agents, to avoid the technical difficulties and the possible toxicity encountered with the peripheral route of administration [1,2]. Totally implantable systems are increasingly used worldwide. Their effectiveness and patient acceptability are remarkably high [1,2]. In patients with lung cancer (and, much less commonly, in subjects with other thoracic malignancies) indication for chemotherapy is often confirmed on the basis of data of mediastinal exploration obtained by mediastinoscopy. In the present paper we report our technique for positioning of totally implantable venous access system at the same operative time and through the same cervical incision employed for mediastinoscopy.

2. Technique

Clinical and radiological data of all patients with suspected or proven thoracic malignancy are discussed at a joint meeting with surgeons, pulmonologists, radiologists, pathologists, medical oncologists and radiotherapists. Indications for diagnostic and staging procedures as well as for eventual chemotherapy are established by this multidisciplinary team.

Cervical mediastinoscopy is performed with the patient in dorsal decubitus and a roll under the shoulders to provide hyperextension of the cervical column. A 3-cm transverse skin incision 1 cm cranial to the sternal notch is employed. Mediastinal exploration is performed according to the standard technique. Frozen sections of suspected tissues are routinely carried out. Mean wait time for frozen sections is 15 min. If indication for placement of a permanent intravenous access device is recognized, this is performed through the same cervical incision. The posterior aspect of the sternal head of the right sternocleidomastoid muscle is dissected over 4 cm in length and retracted laterally and upward, whereas strap muscles are gently retracted medially. Further dissection of cellular tissue behind the sternocleidomastoid muscle allows exposition of the right internal jugular vein (Fig. 1). The anterior and lateral aspect of the vein are dissected over 3 cm; encircling of the vessel is not necessary. A 5-0 polypropylene purse-string is prepared on the lateral aspect of the vein. The vein is punctured in the middle of the purse-string with a 16-gauge needle directed toward the right jugulo-subclavian confluent. The previously heparinized catheter is descended 15 cm by using the Seldinger technique. The purse-string is then knotted and the same sutures are employed to fix the catheter. The catheter is cut and the stainless steel chamber connected by a locking ring. Through the same incision a subcutaneous pocket is developed by sharp dissection over the clavicle in the right prepectoral area. The pocket should be large enough to contain the chamber; excessive dissection should be avoided, in order to prevent dislocation or rotation of the chamber. The chamber is subsequently...
placed in the prepectoral pocket; its correct functioning is verified and it is then left on ‘heparin lock’. After hemostasis verification, platysma is sutured with running polyglactin 4-0. Skin is sutured by an intradermic absorbable 4-0 suture (polydioxanone). Chest X-ray is carried out in the recovery room.

We employed this technique in 48 patients. No early or late complication related to the technique was recorded.

3. Comment

Several techniques for positioning of permanent devices for central venous access have been reported: catheterization of the cephalic, the subclavian, the internal or external jugular vein may be employed [1–5]. Other accesses (through the inferior vena cava, the intercostal, the internal mammary, or the femoral vein) are rarely necessary [6,7]. Subclavian and internal jugular vein may be catheterized by open or percutaneous approach; each of these techniques presents advantages and inconveniences [8]; so in the absence of indication for a specific type of access, the choice of both the vein and technique of access is based on surgeon’s experience and preferences. In our institution it is general policy to employ surgical exposition of right internal jugular vein for placement of implantable devices; a classical incision between the two heads of the sternocleidomastoid muscle is employed when no concurrent mediastinoscopy is performed. With the technique we report herein, the exposition of right internal jugular vein through the incision of mediastinoscopy is less satisfactory than that obtained with the classical incision between the two heads of the sternocleidomastoid, but sufficient to perform the catheterization of the vein without increased risks of complications. We think that in this particular setting, the Seldinger technique offers the advantages of reduced bleeding. Furthermore, the relative rigidity of the introducer represents a guarantee against incorrect positioning of the catheter: when the introducer is gently descended 15 cm in the vein, its tip will be placed surely in the superior vena cava. On the basis of this consideration we do not perform routine radioscopy in the operative room, thus avoiding increase in operative time and problems related to radioprotection. The use of the same skin incision for the mediastinoscopy, the venous access and the chamber positioning provides further reduction in the operative time. Furthermore, cosmetic results are obviously better and this may be important, especially in young patients with hematologic diseases who have a high possibility of cure. We did not observe any postoperative wound infection, though it is possible to hypothesize that a combined procedure through a single skin incision carries a lower infection risk than two separate procedures (with two skin incisions). A prospective study will be necessary to study this subject.

We think that our technique is simple, safe and may provide increased patient acceptability. It could be particularly useful in the management of lung cancer patients with stage IIIA disease.

References