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Workshop brachytherapy bronchus

Overview brachytherapy bronchus

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1. Introduction

Lung cancer is the leading cause of death in men and the second in women in the developed world. Between 60 and 70% of these tumors are diagnosed in advanced stages, presenting symptoms resulting from neoplastic disease itself. There are several therapeutic endoluminal as dilation of the airway, electrocautery, argon therapy, laser therapy, photodynamic therapy, cryotherapy and brachytherapy especially bronchus.

The BRT endobronchial: involves placing, through bronchoscope, a guide catheter bronchus and subsequent application of a radioactive source using a manual or automatic afterloading.

2. Historical evolution

Lung brachytherapy is a technique that gives detailed look at present is being rediscovered. A first "pioneer stage" begins in the first third of the twentieth century. Yankauer Sydney was in New York (USA), who in 1922 published the implementation of capsules Radon (^{222}Rn). Kernan later in 1933 will be the first to publish a series of brachytherapy in trachea and bronchus in 10 patients using ^{222}Rn seeds.

Simultaneously Grajan and Singer, also in 1933 made the first interstitial implant between 1936, a thoracotomy with ^{222}Rn seeds. Pool published a large series of 42 patients that were included in the primary tumors and recurrences.

A second stage called "modern era" began in the 70s with the introduction of new techniques using interstitial isotopes such as iodine (^{131}I) and palladium (^{103}Pd) in obstructive tumors. These techniques had a higher security profile on the professionally exposed personnel and patients themselves. It is from the 80s, when there appear publications using afterloading systems in bronchial brachytherapy.

Today we speak of the "contemporary stage", where the brachytherapy bronchus develops current technological development, incorporating the new information technologies, electronics and telecommunications have led to the introduction of new imaging devices such as multislice CT high resolution 3D virtual simulation systems and 3D planning systems algorisms fast and accurate calculation. They have introduced automatic remote loading high dose rate (HDR) for easy handling with radioactive sources of ^{192}Ir millimeter with a high safety profile and cost effectively.

3. General indications for endobronchial brachytherapy

3.1. *Palliative treatment*

In primitive or metastatic malignant tumors that involve light and are not subsidiaries of treatment (surgery). It is the main indication and can be divided into two groups:

1. Symptomatic patients.
   - Dyspnea, cough, hemoptysis and repeated obstructive pneumonia.
2. Asymptomatic patients
   - Endobronchial recurrence of carcinomas underwent surgery, chemotherapy, radiation therapy or previous treatment, affecting the bronchial tree.
   - Desobstructivas complement other palliative techniques (laser, cryotherapy, etc).

3.2. *Curative treatments*

- Surgical resection of lung cancer resection edges affected.
- Tumors *in situ* in patients not candidates for radical surgery.

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- Tumors stage IA (T1N0M0) limited to the bronchial wall in cases for surgical treatment, for medical reasons or due to patient choice.
- Treatment with external radiotherapy in tumors, endobronchial brachytherapy as adding boost.

4. Contraindications

- Inability to correctly position the catheter, or bypass the distal end of the tumor.
- Severe obstruction of the trachea, and main bronchus greater than 60%.
- Severe obstruction of the tracheal lumen (>70%).
- Obstruction or extrinsic compression endobronchial involvement.
- Peripheral tumors.
- General contraindications to bronchoscopy.
- Life expectancy of less than a month.
- Status (ECOG > 2, Karnoffsky Index < 60).
- Patients eligible for surgery.

5. Results and complications

In palliative care the most relevant is to evaluate the clinical benefit resulting from the improvement of obstructive symptoms and to quantify the degree of endoscopic tumor regression. In curative primary goal is to increase the survival and less symptom control.

The most common acute complications are cough, mild infections, pneumothorax, bronchospasm, heart rhythm disorders and pain in the chest wall.

Late complications such as fatal hemoptysis are the most serious complication that can be observed. There are other complications such as tracheoesophageal fistulas, bronchitis and tracheomalacia.