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ORIGINAL ARTICLE

Tracheal stenosis after intubation and/or tracheostomy

L. Herrak ^{a,*}, S. Ahid ^b, R. Abouqal ^b, B. Lescot ^c, N. Gharbi ^c

^a Service de chirurgie thoracique, Chu Ibn Sina, Rabat, Morocco

^b Laboratoire de biostatistique et de recherche clinique et épidémiologique, Rabat, Morocco

^c Service d'endoscopie interventionnelle, Centre cardiothoracique Marie Lannelongue, Le Plessis Robinson, Paris, France

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KEYWORDS

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Abstract *Introduction:* The tracheal iatrogenic stenosis remains a frequent, sometimes severe tracheal resection, anastomosis is the treatment of choice. However, the endoscopic treatment is used as an alternative therapy.

Materials and methods: We report a retrospective study for a period of 8 years.

Results: 174 patients had an iatrogenic tracheal stenosis of intubation (55.17%) and/or tracheostomy (44.82%).

The appearance and extent of stenosis were assessed by bronchoscopy, we noted a tracheal malacia (15%), a circumferential stenosis (58%), a little tight stenosis (12%) and diaphragm (5%).

Some patients have benefited from several therapeutic procedures, 90 patients were operated on early interventions with 53 and 37 after surgery, an improvement of the patient's clinical status have been postponed earlier, after failure of endoscopic methods. 293 interventional bronchoscopies were performed, 192 stenting, 45 Nd-YAG laser, 55 patients required a recalibration in the tube of the bronchoscope and one patient received cryotherapy, knowing that there are the patients who received combination therapy. We lamented death in the immediate postoperative sepsis, a recurrence of stenosis in 117 patients, and among the 192 implants placed we identified 37 migrations, 52 congestion, development of granulomatous lesions, an overhaul of the prosthesis is noted in 7.29%, three implants were embedded in the tracheal mucosa and there was only one spontaneous rejection. The long-term evolution was satisfactory in 92 patients.

Conclusion: Nevertheless, the management of post intubation tracheal stenosis and/or post tracheostomy cannot be that requiring a multidisciplinary collaboration.

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* Corresponding author. Address: Rue jaafer essediq, Palmier II, Immeuble »C«, Appt 8, Rabat, Morocco. Tel.: +212 666 65 64 36. E-mail address: herraklaila@yahoo.fr (L. Herrak).

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Introduction

The tracheal stenosis is rare but serious complications of tracheal intubation and/or the tracheotomy are responsible for a significant operational impact, the frequency is of the order of 1% [1]. Different lesions can be found: granulomas, tracheomalacia, oesotracheal fistula, the glottis edema etc.

The diagnosis is often late and difficult to draw on the simple clinical conception because the clinical signs are not necessarily typical. Bronchial endoscopy is required to confirm the diagnosis and guide the treatment. Ideal curative treatment is surgery, but in case of permanent contra-indications or in case of emergency for patients with multiple co-morbidities, we decide an interventional endoscopy; this gesture does not prevent a possible subsequent curative surgery [1,2]. The purpose of this study is to clarify, by a retrospective study, the changes, also the endoscopic development of techniques and surgical indications.

Materials and methods

We report a retrospective study conducted in the service of optic fiber endoscopy and interventional endoscopy at the hospital of Marie Lannelogue in France, over a period spanning from January 2000 to May 2007.

During this period, we collected 174 cases of tracheal after intubation stenosis and/or after tracheotomy; we examined the epidemiological and clinical profiles, the radiological data, and especially the different endoscopic therapies and methods performed surgically.

The data were taken and analyzed by using the SPSS for Windows software (version 9.0). In the descriptive analysis of all patients, continuous variables have been expressed by the mean (\pm Standard Deviation); extreme and median. Discontinuous variables were represented by frequencies. The trusted interval of the estimations was 95%.

Results

This is an 8-year study involving 174 patients with tracheal iatrogenic stenosis. The study included 92 men (52.87%) and 82 women (47.13%), the sex ratio is 1:2 (men/women). The average age is 53 years old, with extremes ranging from 1 to 87 years old. Decade in the distribution is shown in Fig. 1.

This care has required several hospitalizations for the practice of one or more acts (endoscopy or surgery), the number of average stay is two hospitalizations per patient with extremes of 1–16 stays. The average length of the stay is 6 days with periods varying from 2 to 25 days; we found that the length of the hospital stay was longer especially for a surgical care.

On the etiological plan, most of the patients have a history of intubation (96 patients or 55.17%) and/or tracheotomy (78 patients or 44.82%). It is therefore tracheal after intubation stenosis and/or after tracheotomy. The causes that triggered the intubation and/or tracheotomy are known and classical causes, with, at the forefront, an acute respiratory failure in 23.6% of cases (41 patients). These patients do present exacerbations with chronic obstructive lung diseases (bpc), of their asthma or having acute respiratory distress.

In the second place we find neurological injuries (38 patients or 21.80%) including cerebral vascular accidents (CVA), brain hemorrhage, head injury and coma of diverse etiologies; 33 patients (19%) were for intube of a previous surgery, 27 patients were victims of heart disease accidents (HDA) (15.50%), 19 patients had heart disease (10.90%), attempted suicide was found in 11 patients (6.3%) and 5 patients had a burn extent (2.9%) as shown in Fig. 2.

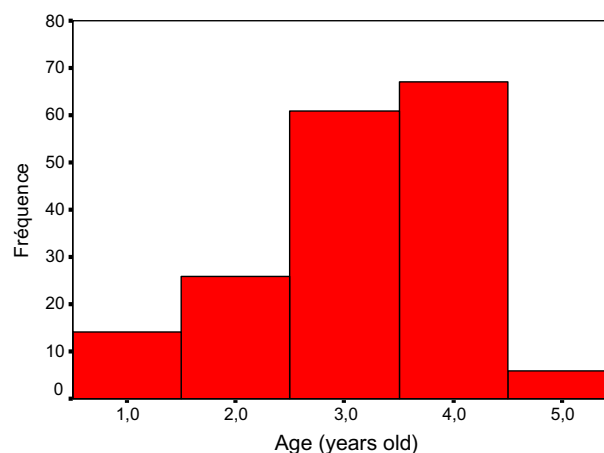


Figure 1 Sharing out of patients according to their age.

The free interval (time between extubation sells and diagnosis of tracheal stenosis) averaged 4 months (median 3), certain stenoses have appeared very early with a space of 7 days, others appeared very belatedly 9 years after the initial intensive care.

The method of discovery was in all cases dyspnea mainly inspirative, compounded by the typical effort with a draw and a cornage (35%), with wheezing chest (25% of cases). In 10% of cases the stenosis was discovered in emergency, setting of an acute dyspnea in the context of an acute respiratory failure. The chest X-ray, used for all patients (100% of cases), was normal in 148 patients, and it has guided the diagnosis of tracheal stenosis in 9 cases by showing a clarity and a tracheal clearness and a tracheal decrease of tube in 17 cases. The scanner chest was achieved in 63% of cases; the lesion was classified as an inflammation in 55% of cases, granulomatous for 26% and fibrous in 19% of cases.

The type and extent of stenosis, ascertaining its severity, have been better appreciated by a bronchial endoscopy which has been carried out for all our patients. Different endoscopic aspects were noted: a trachea in 15% of cases, circumferential tight stenosis in 58% of cases, a little tight stenosis in 12% of cases and diaphragm in 5% of cases.

The location of stenosis in relation to the vocal cords was on average 2.80 cm with a median of 2.5 cm and from 1 cm extreme to 7 cm. Its distance from the shrouds is on average 5.12 cm (median 5 cm) and extremes of 2–8 cm; its breadth average was 2.54 cm with extremes of 1–8 cm (median of 2.25 cm). These measurements were important to be taken into account for the various therapeutic indications. Lastly reducing the size of the trachea, which determines the percentage of stenosis, has averaged 64% (median 70%) and extremes of 10–95% of stenosis (Table 1).

For the care, it is first necessary to note that some patients have gotten several therapeutical processes in the care of their stenosis, and a total of 383 acts, different therapeutically for 174 patients, 90 patients (50.72%) were operated: 53 first interventions and 37 of them had surgical acts; an improvement of the patient's clinical status have been postponed earlier, after failure of the endoscopical methods. The act consisted of a surgical resection anastomosis (termino_terminal), with or without lowering laryngeal depending on the location of the stenosis. We made 293 interventional bronchoscopies, 192 rigid bron-

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