

## Clinical Study on Cervical Phlegmons

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### Rezumat

#### *Studiu clinic asupra flegmoanelor cervicale*

Scopul acestei lucrări este de a elabora un algoritm de diagnostic și tratament al flegmoanelor cervicale pentru a crește acuratețea diagnosticului și a scădea riscurile intra și postoperatorii, rata complicațiilor, precum și pentru a crește numărul cazurilor cu restitutio ad integrum. Studiul de față este unul clinic retrospectiv și a fost efectuat pe un lot de 21 de pacienți diagnosticați cu flegmon cervical. Lotul de studiu este format din pacienți cu celuloflegmon latero și retrofaringian (18 cazuri, din care 2 prin efracție faringiană sau a esofagului cervical prin corp străin inclavat - os de pui și respectiv de pește - cu pneumomediastin), abces retrofaringian și mediastinal posttraumatic (1 caz), flegmon periamigdalian fuzat în spațiul parafaringian complicat cu hemoragie parafaringiană după drenajul spontan al colecției purulente (2 cazuri). Tratamentul a fost eminentemente chirurgical, dublat de tratament medicamentos antibiotic intravenos și a fost individualizat în funcție de particularitatea fiecărui caz: localizarea și extensia flegmonului, complicațiile apărute, durata de evoluție, mecanismele de producere, etiopatogenie, afecțiunile generale asociate, vârsta și nu în ultimul rând opțiunea pacientului.

**Cuvinte cheie:** flegmoane cervicale, tratament chirurgical

### Abstract

The purpose of this paper is to develop an algorithm for the diagnosis and treatment of cervical phlegmons in order to increase the diagnostic accuracy, to reduce the intra and post-operative risks and complication rates and to increase the number of cases with restitutio ad integrum. This is a retrospective clinical study on 21 patients diagnosed with cervical phlegmon. The study group consists of patients with lateral and retropharyngeal phlegmon (18 cases, of which two pharyngeal or cervical oesophagus effractions by foreign body - chicken or fish bone - with pneumomediastinum), retropharyngeal abscess and posttraumatic mediastinal (one case), peritonsillar phlegmon fused in the parapharyngeal space complicated by parapharyngeal haemorrhage after spontaneous drainage of purulent collections (2 cases). Surgical treatment was applied in all cases, associated with intravenous antibiotic medication; the treatment was individualized according to the particularities of each case: the location and extent of the phlegmon, complications, duration of evolution, mechanisms of production, etiology, associated general conditions, age and, not least, the patient's choice.

**Key words:** cervical phlegmons, surgical treatment

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## Introduction

### *Reasons for choosing the topic*

The idea of this paper emerged from discussions within an experienced team of ENT surgeons with extensive experience in the surgical treatment of cervical phlegmons

with various starting points. The complexity of cases varies according to patient's age, associated comorbidities, mechanism of formation, duration of disease progression, prior treatments, etc.

A well-established algorithm for diagnosis and treatment of cervical phlegmons is very useful for any more or less experienced audiologist. The physician must constantly choose various combinations of clinical and laboratory investigations, from simple to complex and expensive as CT, MRI.

Complex anatomy, deep localization, difficult surgical access and the proximity of the vessels of the neck characterize these disorders. (1)

The patients presenting neck phlegmons are at high risk of significant complications like: secondary mediastinitis with mortality rate > 80%, septicemia, internal jugular vein thrombophlebitis, recurrent paralysis, tracheal stenosis post-tracheotomy, cicatricial pharyngo-esophageal stenosis (1), including death – mortality rate = 8%. (2)

There is an important risk of injuring the great vessels of the neck during surgery or in the natural history of disease, with serious consequences, even fatal for the patient, and, on the other hand, for the physician's awareness, malpractice and ethics. Such incidents, accidents or complications may occur, regardless of how well investigated is the patient, how thorough the preoperative plan is or how experienced the operator is. (3) "Man in the neck calls for surgeon's best Judgment, His Best Often for all His skill and courage" - Mosher. (4)

### **Aim of the study**

The aim of this study is to develop an algorithm for the diagnosis and treatment of cervical phlegmons in order to increase diagnostic accuracy and reduce intra- and postoperative risks and complication rates and to increase the number of cases with restitutio ad integrum.

### **Materials and Methods**

This is a retrospective study on 21 patients with cervical phlegmons.

In order to perform the study, we analysed the epidemiological, clinical, imaging, biological, histological and surgical aspects of the patients in the group.

For collection, analysis and interpretation of the data needed to assess the results of the study we used the following algorithm: history, general physical examination, ENT examination, laboratory tests, imaging tests (plain radiographies, CT cervical scan, cervical MRI, cervical ultrasound), upper digestive and respiratory flexible endoscopy, biopsy and histopathology. (4,5,6)

Treatment was individualized according to the particularity of each case: the location and extent of the phlegmon, complications, duration of evolution, mechanisms of production, etiology, associated general conditions, age, and not least, the patient's choice.

Surgery was performed under local or general anaesthesia

with oro-tracheal or tracheal intubation in patients with previous tracheotomy.

Postoperative follow-up was performed according to each case. To control postoperative evolution ENT clinical examination, biological tests, laryngeal endoscopy, and the already mentioned imaging investigations were used. (6,7)

### **Results**

The 21 patients diagnosed with cervical phlegmon had a sex distribution of 12 females to 9 males. Patient age ranged between 36 years - 92 years.

Determinant conditions were: dental infectious foci in 6 cases, 5 cases of acute or chronic tonsillitis, 2 cases of closed trauma, swallowed foreign bodies in the pharynx or oesophagus with effraction of pharynx / cervical oesophagus in 2 cases; in 6 cases a specific cause could not be identified. In literature the most common cause is dental (6,8,9).

The moment of addressing to our clinic ranged from a few hours to 6 weeks after the onset of the disease (2 cases in which the disease was initially "relieved" after administration of antibiotics).

The reasons for hospitalization were: laterocervical or endopharyngeal infiltrative painful / painless swelling, sore throat, dysphagia, fever, neck pain, cervical erythema, endopharyngeal foreign body sensation, torticollis, trismus, fatigue, inspiratory type of respiratory distress, dysphonia. (10)

The main causes of cervical abscesses are associated with old age and associated comorbidities. (9,11,12 )

14 patients presented important comorbidities such as: type 2 diabetes mellitus, coronary heart disease, hypertension, left bundle branch block - LBBB, chronic atrial fibrillation treated with oral anticoagulants, stroke sequelae, hepatitis B, Down syndrome, septic multinodular goitre, secondary anemia, obesity; the 2 patients who had ingested foreign bodies were partially edentulous. (7,11,12,13)

ENT clinical examination revealed an imprecisely delimited anterior or laterocervical swelling, spontaneously painful or painful at palpation manoeuvres, of various sizes with hyperemic or normal skin color (in 18 cases), torticollis (7 cases), trismus (2 cases), cervical gaseous crepitation (11 cases), oral or hypopharyngeal tumefaction (4 cases), laryngeal oedema with narrowed breathing space (12 cases), salivary stasis.

Laboratory tests revealed leucocytosis, elevated fibrinogen and ESR levels.

Dynamic radiological investigations were performed and consisted in front and profile cervical X-rays (which revealed increased edematous prevertebral space, air leakage images at this level, highlighting foreign bodies) and cardiopulmonary X-rays. Native and contrast cervical CT scans were performed in 15 cases; cervical MRI was performed in 9 cases. Thoracic CT scan was required in two cases in which pneumomediastinum and mediastinal abscess were revealed.

Imaging methods were not always confident. In one case a retropharyngeal and mediastinal abscess was described as a

tumor and in 3 cases the lesions described were undervalued in terms of extension. (7)

Upper digestive and respiratory endoscopy were performed in all cases, and samples of secretions and purulent collections were analysed in order to study the bacteriological and mycological flora (polymicrobial flora of aerobic and anaerobic cultures was found in 13 cases; 8 cases were negative, probably due to prior antibiotherapy). Massive inflammatory tissue was revealed in all cases; biopsies excluded malignant disease.

The diagnosis was lateral and retropharyngeal phlegmon in 18 cases, of which two with pharyngeal or cervical oesophagus effraction by inclavated foreign body (i.e. chicken or fish bone) with pneumomediastinum, retropharyngeal abscess and post-traumatic mediastinal (one case), peritonsillar phlegmon fused in the parapharyngeal space complicated by parapharyngeal haemorrhage after spontaneous drainage of purulent collections (2 cases).

Surgical treatment was applied in all cases, associated with intravenous antibiotic medication immediately established on statistical criteria (associations of broad-spectrum antibiotics with anaerobic germs spectrum antibiotics - eg. penicillin G + gentamicin + metronidazole, cefalosporines II -III + metronidazole, clindamycin + ciprofloxacin, Meropenem), anti-inflammatory drugs, fluid resuscitation and blood transfusion in 2 cases. (8,14,15,16)

The surgical treatment was performed in emergency and consisted in cervicotomy and purulent collection drainage for lateral and retropharyngeal phlegmons, with installation of active drainage tubes in retropharyngeal and mediastinal regions which were suppressed, as appropriate, between 5 and 14 days. Emergency or necessity tracheotomy was performed in all cases (high risk of upper airway obstruction, pharyngolaryngeal oedema, salivary stasis, pulmonary aspiration, mediastinitis) decannulation being performed in the next days; alimentation through nasogastric tube was performed for 5 up to 14 days. In the two cases complicated by massive parapharyngeal bleeding with oral exteriorisation (both with significant associated comorbidities) ligation of the ipsilateral external carotid artery and blood transfusions were necessary. (12,13,14,15,17)

In the 2 cases of phlegmons associated with cervical oesophageal rupture (Fig. 2, 3) and pharyngeal rupture through inclavated foreign body (chicken bones, fish bones) the foreign body was extracted via rigid esophagoscopy, while purulent collections were drained.

A 92 year-old patient (Fig. 1), with anticoagulant therapy, quickly developed a retropharyngeal and mediastinal hematoma in the context of acute blunt cervical traumatism that has become infected and spontaneously drained in the hypopharynx; tracheostomy was maintained one month due to bilateral vocal cord paresis which spontaneously resolved (7).

If dental septic foci were discovered, tooth extractions were performed, and if tonsil infections were found, tonsillectomy was recommended. (16,18,19) The most frequent complications were oral haemorrhage, pneumomediastinum, vocal cord paralysis or anaesthetic cervical scars



Figure 1.



Figure 2. Spontaneously hyperdense transfixiant foreign body (bone), in the upper esophageal third segment

There were no deaths.

Postoperative follow up consisted in local clinical examination in all cases, scopes exam, common laboratory tests, cervical thoracic and mediastinal X-rays and, in selected cases, CT or MRI.

## Discussion and Conclusions

In the diagnosis of cervical phlegmons, the protocol that we have proposed must follow the following steps: 1) The history - the onset, how long has the patient had the symptoms and what treatment has he taken, if he/she has dental problems,



**Figure 3.** Density fluid and air leakage (pneumomediastinum) on the left contour of the esophagus

tonsil infections, suffered an injury, has ingested a foreign body and so on, what is his medical history. 2) ENT and general examination of the patient. 3) upper digestive and respiratory flexible endoscopy. 4) paraclinical: usual laboratory tests, cervical and thoracic-pulmonary X-rays, CT scans, MRI, cervical ultrasound, harvesting purulent secretions from the collection for bacteriological and mycological examination, biopsy. (19,20,21,22)

The treatment to be followed in cervical phlegmons consists of: aspirative drainage of the purulent latero-pharyngeal, retropharyngeal, mediastinal collection through cervicotomy; trans-oral drainage of pharyngeal collections, emergency or necessity tracheotomy in order to maintain the permeability of the superior respiratory airways, foreign body extraction by endoscopy with rigid tube when necessary (or cervicotomy with pharyngotomy / esofagotomy, foreign body extraction and drainage in case of endoscopic extraction failure), nasogastric tube nutrition, treatment of infectious foci (dental, etc.) injectable antibiotic treatment, non-steroidal anti-inflammatory, pain reliever, gastric antisecretory, infusion fluid resuscitation, treatment of complications - bleeding (local vascular ligation), thrombophlebitis, septicaemia, recurrent paralysis, pneumonia, respiratory failure, mediastinitis, diffuse hyperseptic cervical cellulitis, post-tracheotomy tracheal stenosis, pharyngo - esophageal scars. (20,21,22,23)

These cases represent a major, life-threatening emergency and require immediate multidisciplinary collaboration: ENT, gastroenterology (upper gastrointestinal endoscopy) imaging, thoracic surgery, ICU, dental. They also imply expensive treatment, prolonged hospitalization, multiple interdisciplinary consults, imagistic re-evaluation in dynamics and the treatment of possible complications - including mediastinitis (8,14).

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