

# Celulite e abscesso profundo do pescoço

Cellulitis and deep neck abscess

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## Resumo

Os autores descrevem um caso de celulite e abscesso profundo do pescoço, por infecção por *Estafilococcus aureus*, numa mulher de 54 anos de idade, caracterizada clinicamente por febre, dores e sinais inflamatórios, com alívio temporário sob antibioterapia inicial oral. Tendo-se instituído antibioterapia endovenosa por reagravamento da situação, assistiu-se a uma recuperação rápida da situação após drenagem espontânea do abscesso à orofaringe.

Aproveitou-se este caso clínico para se fazer uma revisão das séries mais recentes de celulites e abscessos profundos do pescoço, com uma referência particular às infecções dos tecidos moles por *Estafilococcus aureus*. São tecidas considerações sobre os agentes microbiológicos mais frequentes nas infecções profundas do pescoço, seus factores predisponentes, semiologia clínica, evolução, métodos de diagnóstico e indicações terapêuticas habituais.

**Palavras chave:** celulite, pescoço, abscesso, *estafilococcus aureus*

## Abstract

The authors present a case of *Staphylococci aureus* deep neck abscess and cellulitis in a 54 year old woman, characterized by pain, fever and inflammatory signs, with only temporary benefit of symptoms with oral antibiotherapy. After institution of intravenous antibiotherapy and before a decision on surgical therapy,

fast recovery was observed after spontaneous rupture of the deep neck abscess to the oropharynx.

A review of cellulitis and deep abscess of the neck was done, with special reference to *Staphylococci aureus* soft tissue infections. The most common microbiological agents causing deep neck infections, the factors favoring its occurrence, their common clinical symptomatology and evolution, together with the preferred methods of diagnosis and therapy are discussed, through consideration of the data of several published series.

**Key words:** cellulitis, neck, abscess, *Staphylococci aureus*.

## Introduction

*Staphylococci aureus* is ubiquitous in the organism and colonizes permanently the nasopharynx of 20-30 % of the normal adult population. Nasal carriage is more prevalent in subjects with diabetes mellitus and in heroin addicts<sup>1</sup>.

Several enzymes and toxins secreted by *Staphylococci aureus* are thought to contribute to producing disease, alfa and delta toxins, exfoliative toxin, erythrogenic toxin, coagulase, DNAase, lipase and hialuronidase. Host factors can protect against spreading of infection, namely through effective clearance by the reticuloendothelial system. Underlying diseases such as diabetes and renal insufficiency, alcoholism and cirrhosis, malignancy, and immunomodulatory therapy (corticosteroids, immunosuppressors) can contribute to the development of that kind of infections<sup>2</sup>.

Infections by *Staphylococci aureus* are a major source of morbidity and mortality. Soft tissue infections are the most common staphylococcal infections and are in general quite severe, even when they are localized to particular sites. Complications are frequent and bacteraemia a common finding. Local factors breaking the integrity of the skin predispose to infection (trauma, skin diseases, vascular manipulations, ulcers).

Deep infections by *Staphylococci aureus* can be divided in non-localized and localized infections. Included in the first group are cellulitis, erysipela and fasciitis, whereas in the second are boils (furuncles), infected pustular acne, carbuncle, and abscesses<sup>2</sup>.

Deep neck abscesses (DNAs) are less common today than in the past, probably due to more early use of antibiotherapy and improved dental care. In the preantibiotic era pharyngotonsillitis was the cause in nearly 70% of DNAs, whereas dental infection was the cause in only 20% of the cases. In inner city populations, violence (infected mandibular fractures)<sup>3</sup>, endovenous drug abuse, and lack of good medical and dental care, are responsible for DNA to

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be a relatively frequent entity. In a review by Parhiscar<sup>4</sup> of 210 cases of DNAs between 1981 and 1995 in Brooklyn (N.York), causes were dental infection (43%), intravenous drug abuse (12%) and pharyngotonsillitis (6%). *Streptococci viridans* was the most common pathogen (39% of positive cultures), followed by *Staphylococci epidermidis* and *Staphylococci aureus* (22% each).

Cases of DNAs due to methicillin-resistant *Staphylococci aureus* are favored by lengthy hospital stay, use of multiple antibiotics, multiple invasive procedures, ventilatory support and open wounds such as pressure sores and burns<sup>5</sup>.

Some studies report high rates of resistant organisms in AIDS patients with DNAs<sup>6</sup>. In common with other authors, data from Odell<sup>7</sup> show that two-thirds of bacterial cultures of DNAs were polymicrobial. Thirty-five percent of positive cultures for anaerobes were possibly an underestimate of the role of anaerobes in DNAs, due to widespread antibiotherapy use prior to cultures and poor collection techniques. Other recent studies have also demonstrated changing trends in the causes, bacteriologic findings, diagnosis and management of DNAs<sup>8,9,10,11</sup>.

In the series of Parishar<sup>4</sup> lateral pharyngeal space abscess was the most common form of DNA, followed by submandibular space abscess, Ludwig's angina, and retropharyngeal space abscess. Tracheotomy was necessary in many cases of Ludwig's angina.

## Clinical report

A white married woman of 54 year old was admitted on JULY 94 with a clinical diagnosis of acute cellulitis of the left supraclavicular area. She was well until 15 days before, when she began to feel constant dull pain on the left supraclavicular area. She was treated with NSAID, with some amelioration during four days, and then becoming worse with erythema and oedema of the same area. She was treated with erythromycin for five days, becoming almost asymptomatic, but worsening again after stopping antibiotherapy, then for the first time with 37.5° C of temperature, feeling unwell and complaining of odinalgia, and anorexia. The local inflammatory signs become much worse. She was not diabetic and had no congenital or acquired risk factors of immunosuppression. She denied to smoke and referred to drink red wine every day (50 gr of ethanol daily). In the past story she referred irregularly treated hypertension, several episodes of amygdalitis in the last years, and the use of oral contraceptives until two years before.

She had 39° C of temperature, blood pressure was 13/9 cm Hg and she had an heart rate of 110 beats/min. and a respiratory rate of 20/min.. The patient weighted 70 kg. There were no signs of dehydration. The neck showed accentuated inflammatory oedema of the left anterolateral region, with frank tenderness, and with extension of the inflammatory process to the highest part of the anterior region of

the thorax. The oropharynx had moderate inflammation and the floor of the mouth showed no abnormalities. Neither regional or generalized lymphadenopathy were observed, and thyroid examination was normal. Lung sounds were normal as well as heart auscultation. The abdomen showed no abnormalities. There was no signs of phlebothrombosis and of oedema of both legs.

Blood tests showed hyperleucocytosis (20.200/mm<sup>3</sup> with neutrophilia 92.5%); hemoglobin 11.1 g/dl; platelets 467.000/ mm<sup>3</sup>; ESR 102 mm; fibrinogen 1146 mg/dl; normal coagulation tests; normal liver and renal function tests; normal thyroid function tests.

US scan and CT scan of the neck revealed aspects of necrosis/abscess of left supraclavicular area, apparently involving the thyroid and adjacent soft tissues of the neck (Fig. 1), and multiple regional "inflammatory" lymph nodes. The flow of the internal jugular vein was maintained, although there was suspected signs of jugular vein thrombosis on a second US scan some days later (we had no access to this examination), but CT scan did not confirmed that data, so that we decided to do not begun anticoagulation. We promptly initiated empiric therapy with intravenous ceftazidime and vancomycin, before cultural examination of the aspirated pus of the abscess, which showed the growth of colonies of penicillin resistant *Staphylococci aureus*.

Despite some amelioration of the inflammatory signs the patient was transferred at the third day of antibiotherapy to the Surgical Unit. At that Unit and before a definitive decision about incision and drainage of the abscess, the patient suddenly had strong odinalgia, followed by elimination of pus by mouth, and fast clinical recovery after that episode. Antibiotherapy was maintained for one month.

The patient is completely well, ten years after this infectious process.

## Discussion

Cellulitis is a deep-seated spreading infection caused usually by *Streptococci pyogenes* or *Staphylococci aureus* which enter through minor abrasions or longstanding ulcerating conditions of the skin. The area of cellulitis is clearly demarcated by inflammatory signs. Involvement of regional lymphatic vessels and lymph nodes are common, as systemic symptoms too. If localized necrosis occurs in its evolution, abscesses are formed. In severe cases of cellulites, infection can involve adjacent fascia and musculature. *Haemophilus influenzae* is an occasional cause of localized violaceous cellulitis affecting the face<sup>12</sup>. The predominant microbiology in different anatomical sites correlates with the normal flora adjacent to the infected site. In a review by Brook<sup>13</sup>, the highest recovery rate of anaerobes was from the neck, trunk, groin, external genitalia, and leg areas. Aerobes outnumbered anaerobes in the arm and hand.

Certain clinical findings correlated with the following

organisms:

- swelling and tenderness: *Clostridium sp*, *Prevotella sp*, *Staphylococci aureus*, and group A *Streptococci*
- regional adenopathy: *B fragilis group*
- bullous lesion: *Enterobacteriaceae*
- gangrene and necrosis: *Peptostreptococcus sp*, *B fragilis group* and *Clostridium sp*

Certain predisposing conditions correlated with the following organisms:

- trauma: *Clostridium sp*
- diabetes: *Bacteroides sp*, *Enterobacteriaceae*, and *Staphylococci aureus*
- burn: *Pseudomonas aeruginosa*

These data highlight the polymicrobial nature of cellulitis.

In a review 101 cases of cellulitis of the head, neck and extremities, Gionsberg<sup>14</sup> found that a clinical prodrome of general signs was not so common as usually believed, inflammatory signs were universal, but fever was generally mild and leucocytosis is generally slight. Therapy included a penicillinase-resistant penicillin and incision and drainage when indicated.

The 147 cases of head and neck cellulitis seen over a 15-year period by Kimura<sup>15</sup> in a community Hawaiian hospital, were subdivided in 3 groups: 1 – Otolgic cellulitis, mainly related with *Pseudomonas aeruginosa* otitis externa; 2 – Cervical cellulitis, frequently associated with malignancy, dental infections, or lymphadenitis; 3 – Facial cellulitis, almost always caused by *Staphylococci sp* and *Streptococci sp*, usually preceded by dental infections, traumatic abscesses, or sinusitis. Only one patient developed a complication (cavernous vein thrombosis and oculomotor palsy), all others recovered completely, seventy-five percent recovering with parenteral antibiotics alone, the others requiring abscess drainage and/or other surgical procedures, especially if neck infection was present.

DNAs occur in a wide age range, predominantly at third or fourth decade, possibly due to the relatively high rates of dental infection and intravenous drug addicts in this age group. Deep neck infections continue to be seen despite the wide use of antibiotics. These infections follow along fascial planes to create deep neck abscesses. The clinical presentation points to the space involved. In a review of 24 cases of DNAs by Gidley<sup>16</sup> fifty percent of the patients had received antibiotics for an infection of the ear, nose, or throat before the development of a neck space abscess. In descent order of frequency, DNA was found in the parapharyngeal space, retropharyngeal space, submandibular and parotid spaces. The most common organism in 18 positive cultures were *Streptococci* (13), *Staphylococci* (6), *Bacteroides* (5), *Micrococcus* (2), *Neisseria* (2), and *Candida*, *Enterobacter*, *Enterococcus*, *Peptostreptococcus*, *Proteus*, *Propionibacter*, and *Pseudomonas*, all with

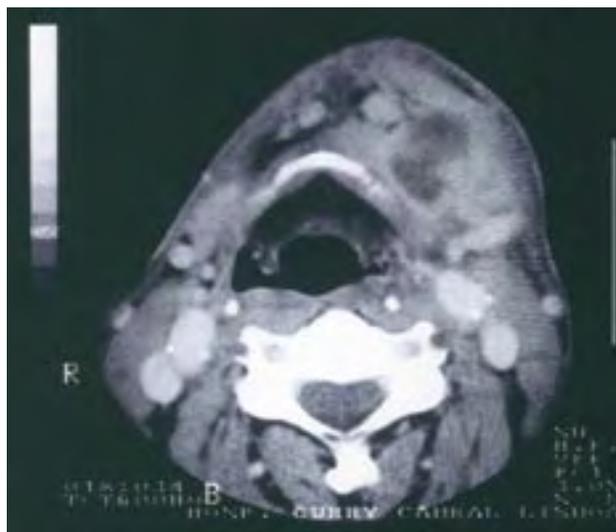


Fig. 1 – Abscesso profundo do pescoço, observando-se várias áreas necróticas, uma delas adjacente à faringe.

one isolate. Six patients had microorganisms only found on Gram's stain.

DNAs can cause some rare complications, namely if there is a long delay before diagnosis and treatment. These are internal jugular vein thrombosis (Lemière-like syndrome), carotid artery pseudoaneurism and artery rupture, mediastinitis, tracheo-esophageal fistula, and meningitis<sup>17-21</sup>. Deaths due to DNAs are very rare, if therapy is adequate.

Contrast-enhanced CT scanning is usually necessary to confirm the diagnosis and to assess the extent of the abscess and its complications, mostly of retropharyngeal and parapharyngeal space abscesses. In only 20% of the cases is contrast-enhanced CT necessary for the diagnosis of submandibular space abscesses and of Ludwig's angina. All patients with neck cellulitis and DNAs need urgent empiric large spectrum endovenous antibiotherapy and attentive follow-up, for deciding upon incision and drainage, to obviate serious disturbance of the airway. Although needle aspiration of neck abscesses can be adequate treatment in selected cases, it is not the standard treatment of choice<sup>22</sup>. Tracheotomy is performed not rarely in cases of Ludwig's angina.

The choice of the empiric antibiotherapy in our patient could have been different from the one that we chose. Many authors advise to use ceftriaxone and a semisynthetic penicillinase-resistant penicillin. Other authors associate gentamicin to a semisynthetic penicillinase-resistant penicillin. Methicillin-resistant *Staphylococci aureus* infections are generally treated with vancomycin<sup>23</sup>, although teicoplanin, dalfopristin/quinupristin and linezolid are good alternative options<sup>24</sup>. In our patient we didn't find reasons to associate therapy for anaerobic microorganisms.

To our knowledge and after reviewing several big series

on DNA<sub>s</sub>, the spontaneous drainage of a DNA through mouth, as was the case of our patient, was not yet described. We decided to publish the case of our patient, not to advise an attitude of expectation on these situations, but to refer a possible complication that can be very serious. Happily our patient had a good evolution.

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