Acta Biomed 2022; Vol. 93, Supplement 1: e2022128 DOI 10.23750/abm.v93iS1.12652

Case report

An unusual cause of obstructing laryngeal edema: Forestier's disease. Case report and literature review

Paolo Tropiano[1], *Teodosio De Bonis*[1], *Gerardo Petruzzi*[2], *Giulia Zambonini*[1], *Sauro Giommetti*[1], *Mario Faralli*[1], *Giampietro Ricci*[1]

[1]Department of Otolaryngology - Head and Neck Surgery, University of Perugia, Perugia, Italy; [2]Department of Otolaryngology-Head and Neck Surgery, IRCCS Regina Elena National Cancer Institute, Rome, Italy

Abstract. Forestier's Disease or Diffuse Idiopathic Skeletal Hyperostosis (DISH) is a systemic condition characterized by the ossification and calcification of ligaments and entheses. DISH is observed on all continents and in all races, but most commonly in men over 50 years of age. Clinical symptoms resulting from DISH are related to altered skeletal biomechanism that may lead to decrease range of motion and painful stiffness of the axial and peripheral locomotor apparatus. When hyperostosis is localized at the spine at the level of glottic plane, it can lean to ENT symptoms including swallowing disorders, dysphonia, rarely dyspnea. The case report proposed refers to a rare DISH clinical presentation with chronic dyspnea. Fiber optic laryngoscopy was performed: a mucous flap of the posterior wall of the sovraglottic larynx reduced the respiratory space, the edematous tissue was aspired below during inspiration. CT with contrast medium was performed and osteophitic process of the anterior longitudinal ligament was diagnosed, in complete absence of neoplastic neoformation. At first conservative treatment was decided and corticosteroid therapy was introduced. He was managed successfully with an anterior cervical osteophytectomy. DISH is not a rare disease, but it is often undiagnosed. This diagnostic hypothesis should be considered in elderly patients presenting with dysphagia, dysphonia, sleep apnea, pharyngeal globus, which are common symptoms in otolaryngology practice. The suspicion must lead to an endoscopic and radiologic investigations. Early diagnosis is important for the initiation of a multidisciplinary approach that will improve the patient's quality of life. (www.actabiomedica.it)

Key words: Forestier's disease, laryngeal edema, DISH

Introduction

Forestier's disease was first described by Forestier and Routes-Querol (1) in 1950 and subsequently renamed Diffuse Idiopathic Skeletal Hyperostosis (DISH) in 1975 (2). It is characterized by a non-inflammatory ossification of the anterior vertebral longitudinal ligament, therefore, it can affect the entire spine and subsequent development of osteophytes (3). The ethiopathogenesis of DISH is still unclear to date, although recent studies attribute it to the association of genetic risk factors and acquired metabolic factors. The incidence is estimated to be 12-30% in patients over the age of 65, depending on gender (F = 15%; M = 25%)(4).

Case report

82-year-old, male patient has come to the attention of our clinic, in January 2020, for weighty dyspnea and inspiratory stridor and dysphonia for about a year. He has hypertension and poorly controlled type II diabetes mellitus. Then he performed fiber optic laryngoscopy which highlighted hyperplastic mucosal flaps

of the postero-superior part of the larynx, which was aspirated below the glottic plane, which was not fully viewable, during inspiration (shown in Figure.1).

Therefore, the patient was hospitalized and waiting to be subjected to an eventual emergency tracheotomy, he performed a neck CT with contrast medium, that confirmed the presence of a gross osteophytic process and ossification of the anterior longitudinal ligament at the somatic bodies C2-C5 which determined a significant compressive effect on the posterior wall of the subglottic larynx, with a clear reduction of the aerial column, in complete absence the neoplastic tissue (shown in Figure.2). He performed an x-ray of the lumbar spine and pelvis, which ruled out the inflammatory involvement of the sacroiliac joint, thus avoiding the diagnosis of ankylosing spondylitis (AS).

We undertake conservative treatment at first, considering the chronicity of dyspnea and the absence of current indication for an emergency tracheotomy, by administering IV corticosteroid drugs (betamethasone 4mg IV bid). In the days following, there was a progressive improvement in subjective respiratory symptoms but they haven't completely regressed; in fact at a fibroscopic check, the patient showed persistence of oedema. Then we asked a neurosurgical evaluation, during which the indication for an intervention was given. In February 2020, the patient performed an intervention for the removal of osteophytosis of the anterior cervical spine, through a left anterolateral cervicotomy. At the first post-operative ENT control, which showed oedema stay unchanged, it was decided to undertake a new steroid therapy with deflazacort 30 mg per OS: one tablet bid for 20 days, then qd for other 10 days. The use of this corticosteroid is justified by the fact that it has little interference with glucose metabolism and therefore was better tolerated by the patient. Although, to the next check, the oedema did not completely regress, there was an improvement in dyspnea and dysphagia and a substantial reduction of the mucous flap, such as to make the glottic plane currently explorable. (shown in Figure 3).

This picture was also confirmed by a new neck CT scan, brought for inspection at the last check-up. (shown in Figure 4)

The patient underwent to monthly check-up in which the reduction of oedema and the stability of the clinical picture was confirmed, after six months of follow-up.

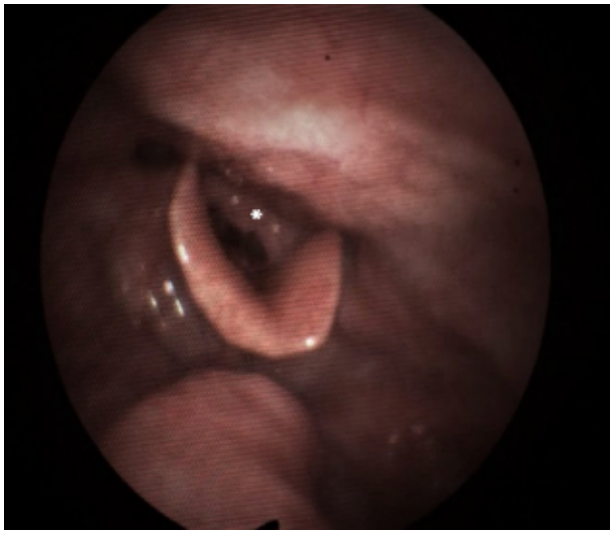

Figure 1. Fiber optic laryngoscopy performed on admission, showing laryngeal mucous flap (*): glottic plane not explorable.

Discussion

The genetic risk factors concern polymorphisms of the gene COL6A1, that codifies for the alpha helix chain of the collagen fibres of type VI, which is an extracellular matrix protein that might serve as a scaffold for osteoblastic or pre-osteoblastic cells or chondrocytes that subsequently proceed to membranous or endochondral ossification (4).

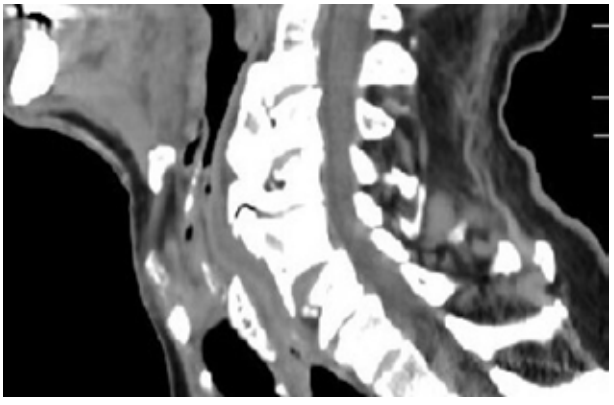

Figure 2. Neck CT scan performed on admission, showing the reduction of air space at the laryngeal level.

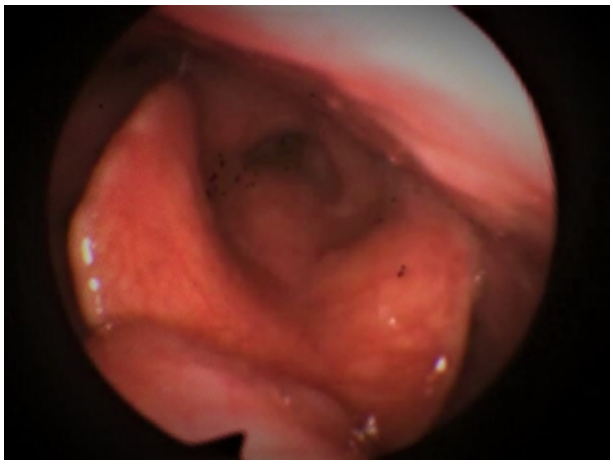

Figure 3. Fiber optic laryngoscopy performed at the last checkup (six months after admission), showing reduction of laryngeal mucous flap: glottic plane explorable.

Genetic risk factors are often associated with metabolic factors, like obesity, dyslipidemia, hypertension, glucose intolerance, type 2 diabetes, hyperuricaemia, hyperinsulinaemia and possibly elevated growth hormone and insulin-like growth factor 1 (IGF- 1) levels. IGF-1, in fact, mediates the actions of growth hormone on bone by stimulating the proliferation of fibroblasts and chondrocytes (4). Our patient was suffering from type II diabetes mellitus and a related metabolic syndrome, with signs of vascular microcirculation damage at the retina level, as well as being in long-term hypertension therapy.

Very often the DISH is confused with AS, even if it differs from this for the absence of inflammatory signs of the sacred-iliac articulation and for the absence of the aplotype HLA-B27, which is typical of the AS.

The clinical presentation of the DISH is polymorphic, it can remain completely asymptomatic or manifested with ENT symptoms, such as dysphagia and swallowing disorders, for involvement of the cervical rachis with subsequent pneumonia *ab-ingestis* (5); while if the osteophytes localize to the level of the glottic plane, they can cause dysphonia for ab-extrinsic compression, up to the palsy of the vocal cords and less frequently arise with wheezing. Another rare clinical situation, already described by Marks B. et al. in 1998 is the one presented in our case-report of hypopharyngeal-laryngeal oedema.

The diagnosis is purely radiological and follows criteria outlined in 1978 by Rensick (2). The presence

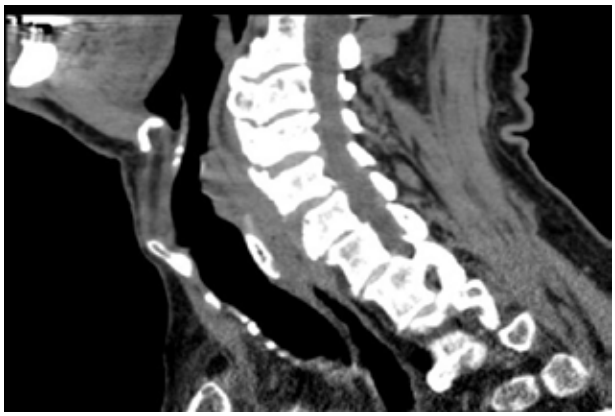

Figure 4. Neck CT scan performed six months after admission, showing a significant increase of air space at the laryngeal level.

of flowing calcification and ossification along the anterolateral aspect of at least four contiguous vertebral bodies with or without associated localized pointed excrescences at the intervening vertebral body intervertebral disc junctions;

1. relative preservation of intervertebral disc height in the involved area and the absence of extensive radiographic changes of "degenerative" disc disease, including vacuum phenomena and vertebral body marginal sclerosis; and
2. absence of apophyseal joint bony ankylosis and sacroiliac joint erosion, sclerosis, or intraarticular osseous fusion.

The treatment depends on the severity of symptoms and it can be conservative with anti-inflammatory therapy, and be sufficient as it was been in our patient, or in the most serious cases, it is recommended to resort to a surgical therapy designed to remove osteophytis.

Conclusion

In view of data on the incidence of DISH and the fact that the presentation of the disease with laryngeal edema is not very frequent, we recommend to take into account once excluded the other most frequent causes and to put in place adequate medical or surgical therapy, or by exploiting the synergistic effect of both therapies, as in our case and in cases with severe symptoms.

Statement of Ethics: This case report is comply with the guidelines for human studies and was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

References

1. Forestier J, Rotes-Querol J Senile ankylosis hyperstosis of the spine. Ann. Rheum Dis 1950; 9: 321-330.
2. Resnick, D, Niwayama, G Radiographic and pathologic features of spinal involvement in diffuse idiopathic skeletal hyperostosis (DISH). Radiology 1976; 119: 559-568.
3. Marks B, Schober E, Swoboda H Diffuse idiopathic skeletal hyperostosis causing obstructing laryngeal edema. Eur Arch Otorhinolaryngol 1998; 255: 256-8.
4. Mader R, Verlaan JJ, Buskila D Diffuse idiopathic skeletal hyperostosis: clinical features and pathogenic mechanisms. Nat Rev Rheumatol 2013;9: 741-750.
5. Pulcherio JO, Velasco CM, Machado RS, Souza WN, Menezes DR Forestier's disease and its implications in otolaryngology: literature review. Braz J Otorhinolaryngol 2014; 80:161-166.

Correspondence
Received: December 7, 2021
Accepted: December 16, 2021
Paolo Tropiano
Otorhinolaryngology Clinic,
S.M. della Misericordia Hospital
Via G. Dottori 1, S. Andrea delle Fratte,
06100, Perugia (PG), Italy
Phone: +39-389-0988939
Fax: +39-075-5783574
Email: tropianopaolo@gmail.com
ORCID: https://orcid.org/0000-0002-6328-1511