

# Total Fixation of Cricothyroid Joint of a Patient with Rheumatoid Arthritis and Hashimoto Thyroiditis

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## SUMMARY

**Introduction** The incidence of cricothyroid joint fixation in case of rheumatoid arthritis is 17 to 33%. In later stages of rheumatoid arthritis, a gradual fixation of cricothyroid joint develops and both halves of the larynx become less movable which calls for endotracheal intubation; while total fixation of this joint demands surgical tracheotomy. Hashimoto thyroiditis can display symptoms which are difficult to distinguish from the ones present in total fixation of cricothyroid joint caused by rheumatoid arthritis.

**Case Outline** A 60-year-old woman in terminal stage of rheumatoid arthritis and Hashimoto thyroiditis, diagnosed after clinical and other examinations. She was treated for strident breathing with surgical tracheotomy. The microscopic examination of the larynx with the use of laryngoscopic pincers suggested the immovability of the right and very limited movability of the left arytenoid cartilage. A computerized endovideoscopy showed only passive vertical vibrating movements of the right vocal cord and irregular vibrations of the left vocal cord.

**Conclusion** Total fixation of the cricothyroid joint can be caused by many pathological processes, but so far references have shown no case of rheumatoid arthritis and Hashimoto thyroiditis. In differential diagnostics, one of many examinations is the microscopic examination of the larynx, but it is very important to determine the movability of the arytenoid cartilage with the use of appropriate instruments in total endotracheal anaesthesia while the patient is fully relaxed. Movements in cricothyroid joints in patients with Hashimoto thyroiditis and the same conditions are preserved.

**Keywords:** cricothyroid joint; rheumatoid arthritis; Hashimoto thyroiditis

## INTRODUCTION

The cricothyroid joint is a straight diarthrodial joint consisting of the cricoid and arytenoid cartilage and is located in the upper lateral part of the cricoid cartilage. As with other diarthrodial joints, the joint area is surrounded by the synovial membrane and the synovial liquid fills the enclosed area of the fibrous joint capsule. The structure of this joint allows two types of movements: rolling and rotation around the joint base and linear sliding parallel to the joint base. These movements control pulling, adduction and the length of vocal cords, thus helping respiration, protecting the respiratory organs and allowing phonation [1, 2]. Clinical symptoms of rheumatoid arthritis are rarely displayed in the larynx, but the references show some cases [3-7]. The incidence of cricothyroid joint fixation in case of rheumatoid arthritis is 17 to 33% [8]. With the development of arthritis slowly comes the fixation of the cricothyroid joint and the movability of the larynx diminishes [9].

Patients describe symptoms such as the feeling of a strange item in the throat, difficulties with swallowing and hoarseness [10]. Further fixation of the cricothyroid joint causes respiratory stridor, peripheral cyanosis, and the use of subsidiary respiratory muscles. The patient is in serious condition which demands endotracheal intubation. If the patient's condition is so serious that it is impossible to perform the intubation, urgent tracheotomy must be performed [11]. The described symptoms also

occur when the cricothyroid joint is affected with injury, other system diseases of connective tissue, systemic lupus, osteoporosis, scleroderma, malignant tumours of the thyroid gland and the larynx. Hashimoto thyroiditis is an autoimmune disease of the thyroid gland which can be manifested in atrophic and hypertrophic form. The values of thyroid hormones are irregular because of the damaged thyroid follicles, and the disease itself can display symptoms which are difficult to see from the ones present in total fixation of the cricothyroid joint caused by rheumatoid arthritis [12]. The hypertrophic form of thyroiditis presses the recurrent nerves causing their paralysis and the immovability of both halves of the larynx, but movability of the cricothyroid joints is preserved. To distinguish the diagnosis of fixation of the cricothyroid joint, it is essential: to have a detailed history, to do indirect laryngoscopy, computerized endovideoscopy, lab analysis, laryngomicroscopy, roentgenography of the lungs and the mediastinum, roentgenography of the oesophagus with the swallowing act, a multi-layer scan of the neck, and the examinations of a neurologist, rheumatologist, endocrinologist and endocrinology surgeon [13, 14].

## CASE REPORT

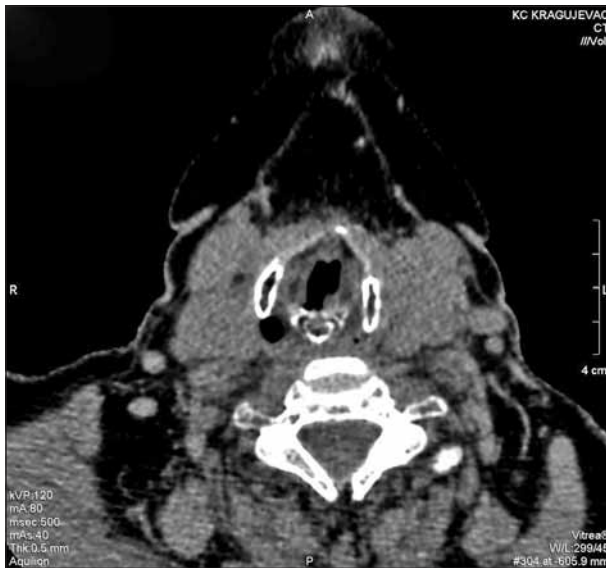
A 60-year-old woman was admitted to the ENT ward of the Clinical Centre in Kragujevac, because of the strident breathing and hoarse-

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**Figure 1.** Rheumatoid changes of hands



**Figure 2.** Rheumatoid arthritis of the larynx. Sclerosis of the right arytenoid.

ness that had lasted for months. For 30 years, she has been treated for rheumatoid arthritis which progressed to its terminal stage (Figure 1) and hyperthyroiditis for which she was treated with Letrox tabl 50 mg at a scheme 1+0+0. Because of very difficult breathing, urgent tracheotomy was done and a metal cannula number 12 was placed. After tracheotomy, the patient was breathing normally, without stridor or peripheral cyanosis. Lab results: RBC sedimentation 100, CRP 100.3 mg/l, WBC  $16.9 \times 10^9$ , FT4 17.3  $\mu\text{IU/ml}$ . According to two-direction lungs roentgenography, there were no active pathological processes in the lung parenchyma, the left hilus was voluminous with the emphasised arc of the pulmonary artery. The arc of the aorta was calcified. The shadow of the heart was increased in the ventricular area. Roentgenography of the oesophageal passage with swallowing act was regular with the exception of tertiary contractions in the distal half of the oesophagus. Indirect laryngoscopy showed immovability of the right and limited movability of the left half

of the larynx, while laryngomicroscopy at total endotracheal anaesthesia (while the patient was fully relaxed) and the use of laryngoscopic pincers showed immovability of the right and extremely limited movability of the left arytenoid cartilage. Computerized endovideostroboscopy revealed only passive vertical vibrating movements of the right vocal cords and irregular vibrations of the left vocal cords. Multilayer neck scan showed no other rheumatic changes on the larynx cartilage joints, except sclerosis of the right arytenoid (Figure 2). Computerized tomography showed degenerative changes of the atlantoaxial joint and sclerosis on the facets of the first and second cervical vertebra and sclerosis of the right arytenoid cartilage. The rheumatologist's examination confirmed the rheumatoid arthritis in terminal stage, while the endocrinologist's examination revealed a slightly enlarged thyroid gland. The endocrinology surgeon performed biopsy of the right thyroid lobe, and the result of pathohistological examination was: a fragment of hyperplastic tissue of the thyroid gland, affected mostly with lymphatic, inflammatory infiltration with the tendency of forming lymphoid follicles. This pathohistological result only indicated the existence of Hashimoto thyroiditis.

## DISCUSSION

Total fixation of the cricoarytenoid joint can be caused by many pathological processes, but so far references have showed no case of rheumatoid arthritis and Hashimoto thyroiditis. Movements in the cricoarytenoid joints in patients with Hashimoto thyroiditis are preserved. In rheumatoid arthritis, the cricoarytenoid joint is affected with various inflammatory processes, joint disruption and ankylosis which, in the advanced stages of the disease, causes total fixation [15, 16]. In differential diagnostics, one of many examinations is the laryngomicroscopic examination of the larynx, but it is very important to determine the movability of the arytenoid cartilage with the use of laryngoscopic pincers in total endotracheal anaesthesia while the patient is fully relaxed [9, 17]. Movability of the cricoarytenoid joints in the same conditions in patients with Hashimoto thyroiditis is preserved, while in patients with rheumatoid arthritis a variable degree of arytenoid fixation may be detected. Multilayer larynx scan revealed no typical changes described by authors, such as the erosion of the arytenoid cartilage, asymmetric opening of the glottis and extraarticular nodules in the arytenoid cartilage, except for the sclerosis of the right arytenoid cartilage [18]. Total fixation brings the vocal cords to the adducted status which disables breathing and surgical tracheotomy is necessary. To distinguish the diagnosis of fixation of the cricoarytenoid joint, a multidisciplinary approach is essential.

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## Обострана фиксација крикоаритеноидног зглоба код болесника с реуматоидним артритисом и Хашимотовим тиреоидитисом

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### КРАТАК САДРЖАЈ

**Увод** Инциденција захваћености крикоаритеноидних зглобова (КЗ) код реуматоидног артритиса (РА) је 17-33%. С развојем РА полако долази до фиксације КЗ, а покретљивост ларинкса се смањује. У каснијем стадијуму се развија делимична фиксација КЗ и обе половине ларинкса постају мање покретне, што захтева ендотрахеалну интубацију, док обострана фиксација КЗ захтева хируршку трахеотомију. Код Хашимотовог (*Hashimoto*) тиреоидитиса (ХТ) могу се испољити симптоми слични онима као код обостране фиксације КЗ изазване РА.

**Приказ болесника** Код шездестогодишње жене су клиничким прегледом и допунским испитивањима дијагностиковани терминални стадијум РА и ХТ, а лечена је хируршком трахеотомијом због стридорозног дисања. Ларингомикроскопски преглед гркљана помоћу ларингоскопских клешта показао је непокрет-

ност десне и ограничену покретљивост леве аритеноидне хрскавице. Компјутеризована ендовидеостробоскопија је открила пасивне вертикалне вибрације десне гласнице и неправилне вибрације леве гласнице.

**Закључак** Обострана фиксација КЗ може бити изазвана различитим патолошким процесима, али досада још није описан случај истовременог постојања РА и ХТ. У диференцијалној дијагнози једно од многих испитивања је микроларингоскопија, али је врло важно установити покретљивост аритеноидних хрскавица помоћу ларингоскопских клешта у општој ендотрахеалној анестезији за време потпуне релаксације болесника. Покрети у КЗ код болесника са ХТ и под истим условима су очувани.

**Кључне речи:** крикоаритеноидни зглоб; реуматоидни артритис; Хашимотов тиреоидитис

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