Cricopharyngeal achalasia in connection with autoimmune disorders in a pre-adolescent patient: A case report

Krikofaringealna ahalazija v povezavi z avtoimunskimi boleznimi v obdobju predadolescence: Prikaz primera

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Abstract

Cricopharyngeal achalasia is an uncommon cause of dysphagia, especially in children. Congenital form is known in neonates and infants. In older children this disease has been reported in very rare cases and mostly in connection with neurological and muscular diseases. We present a case of a 12-year-old girl with a four-year history of dysphagia. Esophagogastroduodenoscopy, radiological contrast swallow study and esophageal manometric study confirmed the diagnosis of cricopharyngeal achalasia. The patient was successfully treated with dilatation of the upper esophageal sphincter. An initial attempt of dilatation appears to be a safe and effective option in the management of cricopharyngeal achalasia in children, and may prevent or at least postpone the need for myotomy. Following the diagnosis of cricopharyngeal achalasia, several autoimmune conditions were diagnosed. Our case report revealed that cricopharyngeal achalasia may occur in association with some other autoimmune conditions, and that autoimmunity may also play a role in cricopharyngeal achalasia itself.

Izvleček

Krikofaringealna ahalazija je pri otrocih izjemno redek razlog za disfagijo. Poznana je kongenitalna oblika krikofaringealne ahalazije pri novorojenčkih in dojenčkih, pri starejših otrocih pa so to bolezen doslej opisali zelo redko in večinoma v povezavi z nevrološkimi in mišičnimi boleznimi. V prispevku prikazujemo primer 12-letne deklice s štiriletno anamnezo disfagije. Z ezofagogastroduodenoskopijo, radiološko preiskavo požiranja s kontrastom in ezofagealno manometrijo smo potrdili diagnozo krikofaringealna ahalazija. Bolnico smo uspešno zdravili z dilatacijo zgornjega ezofagealnega ustja. Začetni poizkus zdravljenja z dilatacijo se zdi varna in učinkovita metoda zdravljenja krikofaringelane ahalazije pri otrocih in lahko prepreči ali vsaj odloži potrebo po miotomiji. Po postavitvi diagnoze krikofaringealna ahalazija smo pri bolnici diagnosticirali več avtoimunskih motenj. Opisan primer prikazuje povezavo pojava krikofaringelane ahalazije z avtoimunskim dogajanjem in možnost, da bi lahko bil tudi avtoimunski proces eden od razlogov za pojav krikofaringealne ahalazije.

Introduction

Dysfunction of upper esophageal sphincter (UES) motility is an infrequent cause of dysphagia in the pediatric population. Evaluation of motor dysfunction of the pharyngo-esophageal junction suggests two main defects of UES

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motility: abnormalities in the sphincter resting pressure and abnormalities in the UES relaxation (1,2). Patients with cricopharyngeal achalasia show incomplete UES relaxation after majority of swallows (1,3). Symptoms usually include dysphagia, food regurgitation, coughing, aspiration pneumonia, and weight loss. There is a functional narrowing in the region of the UES. Since the first description by Chevalier Jackson in 1915 and the first series of patients by Kelly in 1919, this disorder has been frequently observed in adult patients, predominantly secondary to neurologic and muscular disorders, previous neck surgery or irradiation, but also as primary idiopathic disorder, especially in advanced age (4-6). Congenital cricopharyngeal achalasia is a rare condition of unknown etiology, which usually presents with dysphagia, nasopharyngeal reflux during feeding, salivation, and choking in neonates and infants. It may resolve spontaneously, however, in many of these children, similarly as in adults, botulinum toxin applications, dilatations or myotomy are needed to resolve the problem (5-9).

An acquired form of cricopharyngeal achalasia in older children has been reported extremely rarely and mainly in connection with neurological and muscular diseases, e.g. cerebral palsy, muscular dystrophy, mitochondrial encephalomyopathy, Arnold-Chiari malformation (10,11).

We present a case of this rare condition in a pre-adolescent girl without neuromuscular disorders. Furthermore, the possibility that autoimmune mechanisms were involved in its development is discussed.

Case report

A 12-year-old girl presented with a four-year history of dysphagia. She had no congenital, anatomic or neurologic abnormalities, and had an insignificant past medical history. Her eating pattern before the appearance of dysphagia was normal. The patient presented with difficulty in swallowing solid food, sensation of food impaction, and nodding her head during deglutition. The family history was negative for gastrointestinal disorders, but her mother has documented autoimmune thyroiditis. She appeared healthy and well-nourished (50th percentile by weight, BMI at the 40th percentile). The physical and neurological examinations were unremarkable as well as her routine laboratory tests. The esophagogastroscopy was performed under conscious sedation but was unsuccessful due to the inability to enter a normal pediatric size endoscope into the esophagus. Subsequently, a radiological contrast swallow study was performed and interpreted as normal. As a result, the patient was diagnosed and treated for psychogenic dysphagia.

The patient's continuous problems despite one-year-long psychological treatment prompted re-evaluation of her diagnosis. Esophagogastroduodenoscopy under general anesthesia revealed stenosis at the level of the UES with intact mucosa (Figure 1). The lumen was significantly narrowed and it was impossible to introduce normal pediatric endoscope into the esophagus. A small-diameter (5.9 mm) baby endoscope was used to pass the narrowing, and mucosal biopsy specimens were obtained. The esophageal, gastric and duodenal mucosa was macroscopically normal. Histopathologic investigation of several biopsies taken from the proximal, middle and distal parts of the esophagus showed only signs of mild reflux esophagitis (grade 1b), but ruled out pathologic conditions that could result in esophageal stenosis, e.g. eosinophilic esophagitis or intraluminal

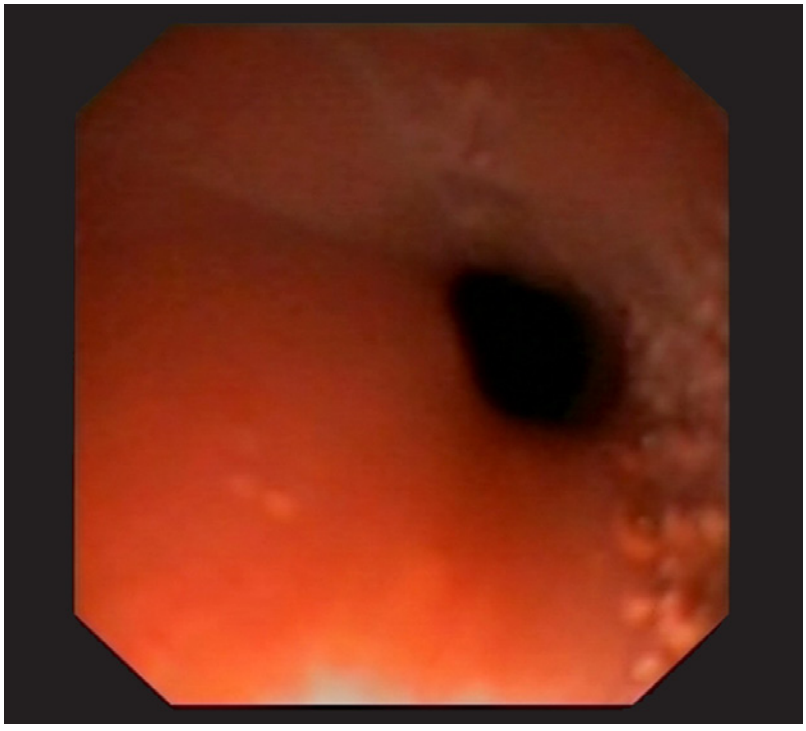

Figure 1: Esophagoscopy with a small-diameter »baby« endoscope. Stenosis at the level of the upper esophageal sphincter with normal mucosa.

tumor growth. The muscularis propria was not included in the biopsy samples. Subsequent radiological contrast swallow study with lateral views revealed narrowing of the cervical esophagus at the level of the UES and incomplete relaxation of the cricopharyngeal muscle during deglutition with prominent horizontal notch on the posterior wall, regarded as a typical characteristic of cricopharyngeal achalasia (Figure 2). In addition, esophageal peristaltic waves were disturbed.

A subsequent revision of the first radiological contrast swallow study revealed that stenosis was already present at that time, but unfortunately, the radiologist failed to pay attention to the signs of cricopharyngeal achalasia due to its rarity in pre-adolescents. The investigation was therefore misinterpreted as normal.

The patient underwent dilatation with a Savary dilator (largest Ch42) under general anesthesia. Immediately following dilatation, symptoms of food impaction at the level of upper esophagus almost completely resolved.

As it was impossible to perform esophageal manometric study before dilatation, we performed it few weeks after. The study demonstrated impaired relaxation of the UES. In addition, severely disturbed esophageal peristalsis was noted, however, achalasia of the lower esophageal sphincter (LES) was ruled out by normal manometric findings of this region.

During the diagnostic process, the patient was referred to an endocrinologist to rule out the Allgrove syndrome, characterized by achalasia of LES, alacrimia and adrenal insufficiency. Glucocorticoid levels were normal, however, elevated TSH with normal free T4 and T3 were found. Clinically and on ultrasonography enlarged thyroid gland was estimated with ultrasonographically homogeneous structure. Additional investigations revealed elevated levels of thyroid autoantibodies (anti-Tg 141 kE/l, anti-TPO >1300 kE/l), the diagnostic hallmarks of Hashimoto's thyroiditis.

A few months later, the patient started complaining about symptoms of dry eyes, prompting a suspicion for Sjögren's syndrome. Despite the diagnosis of dry eye syndrome made by an ophthalmologic examination, the diagnostic criteria for Sjögren's syndrome were not met. Positive ANA titers (1:320) were present, however, autoantibodies for extractable nuclear antigens (ENAs) were negative. In addition, a mild vitiligo localized to the upper extremities was diagnosed in the follow-up period.

The immunological work-up including IgA, IgM, and IgG values, lymphocyte subpopulations, classical, alternative and lectin pathways of complement acti-

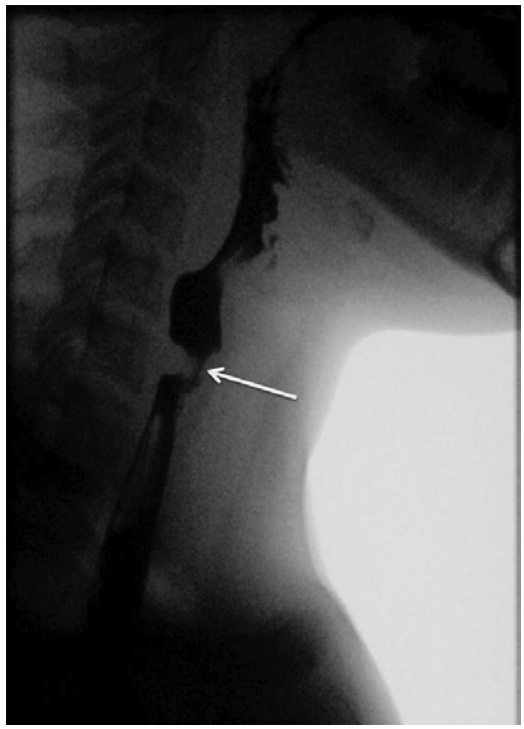

Figure 2: Radiological contrast swallow study. The posterior protrusion at the level of the cricopharyngeus present during deglutition.

vation, and tetanus and diphtheria antitoxin titers were all normal.

Based on these investigations, which revealed additional autoimmune disorders (Hashimoto's thyroiditis, vitiligo, positive ANA), we suggest that cricopharyngeal achalasia may have an autoimmune origin. During the follow-up over approximately one and a half years, the patient is reporting only occasional mild dysphagia for solid food and has no need for any further therapeutic procedures so far.

Discussion

Cricopharyngeal muscle is the main muscular structure of the UES. During the act of swallowing, tonic motor activity in the cricopharyngeus is abolished and relaxation of the sphincter occurs. When UES relaxation is incomplete or uncoordinated with respect to pharyngeal activity, the bolus is mishandled and repeated swallows are necessary to force the bolus into the upper esophagus (1,3).

Various etiologies cause cricopharyngeal dysfunction with dysphagia, e.g. central or peripheral neurologic disorders, muscular disorders, previous neck surgery, irradiation, and old age (5,7). Primary idiopathic cricopharyngeal dysfunction is a recognized entity in middle-aged and elderly patients, but is extremely rare in the pediatric population (3,7).

The pathophysiology of the incomplete relaxation of the cricopharyngeus is not fully understood. Many theories have been proposed to explain the relationship between cricopharyngeal dysfunction and dysphagia. Moreover, the variability in the appearance of the cricopharyngeus and the variety of associated conditions makes a uniform pathophysiological explanation very unlikely. The most widely held theory reasons that the cricopharyngeus, which is normally in a state of tonic contraction, fails to relax to allow the passage of the food bolus into the esophagus. This theory has been supported by radiographic and manometric data.

The work-up should include upper gastrointestinal endoscopy and radiological contrast swallow studies. Endoscopy may show a narrowing at the level of the UES and may be helpful to rule out other organic causes (tumors, reflux esophagitis, eosinophilic esophagitis with stenosis). Radiographically, cricopharyngeal achalasia is characterized by a horizontal indentation on the posterior esophageal wall, with the contrast passing the muscle very slowly and the cricopharyngeal muscle appearing to relax poorly (1,3,7,8). Esophageal manometry may be useful and can provide information on the resting tone and relaxation of the UES (2,3,7,8).

Several treatment modalities are available, such as dilatation, local infiltration with botulinum toxin, and surgical myo-

tomy of the muscle, performed either endoscopically with laser or through an open transcervical approach (5,8). The long-term success of dilatation as a treatment for cricopharyngeal achalasia has been detailed in several reports (4,7,9). In many patients, especially those with mild symptoms, an initial trial of dilatation is probably warranted and surgery should be reserved for those who do not respond to dilatation. Our patient underwent dilatation and had almost no residual symptoms at the level of the upper esophagus.

Compared to cricopharyngeal achalasia, achalasia of LES is more common in the pediatric and adult population. A study that compared the prevalence of autoimmune disease in patients with esophageal achalasia to the general population revealed that patients with achalasia were 3.6-times more likely to suffer from any autoimmune condition (Hashimoto's thyroiditis, Sjögren's syndrome, type 1 diabetes mellitus, SLE, etc.) (12). Our patient has been diagnosed with cricopharyngeal achalasia, esophageal body motor dysfunction as well as a few autoimmune related conditions. These findings led us to presume that cricopharyngeal achalasia's etiology might also have an autoimmune component, similar to achalasia of LES.

Conclusion

Cricopharyngeal achalasia is an extremely rare yet possible cause of dysphagia in the pediatric population. After exclusion of other frequent causes of dysphagia, a combination of esophagogastroduodenoscopy, radiological contrast swallow study, and esophageal manometry can help to confirm the diagnosis. An initial trial of dilatation appears to be a safe and effective option in the management of cricopharyngeal achalasia in children and surgery should be reserved for those who do not respond to dilatation. Our case report revealed that cricopharyngeal achalasia may occur in association with some other autoimmune conditions, and that there is a possibility that autoimmunity may also play a role in pathophysiology of cricopharyngeal achalasia itself. To prove this hypothesis, it would be necessary to do additional studies.

Conflict of interest statement

Authors U. Vucina, P. Kotnik and R. Orel declare that they have no conflict of interest.

This article does not contain any studies with human or animal subjects performed by any of the authors.

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