



Review Article

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Schatzki Ring as A Cause of Dysphagia

Shivani M* and Regash MJ

American International Medical University, Chicago, IL, USA

*Corresponding author: Shivani Modi, American International Medical University, Chicago, IL, USA.

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Abstract

A Schatzki ring also known as Schatzki-Gary ring is a narrowing of the lower esophagus that can cause dysphagia. The narrowing is caused by a ring of mucosal tissue which lines the esophagus or muscular tissue. Schatzki ring was first observed in asymptomatic patient in 1944 by Richard Schatzki who was a renowned radiologist [1,2]. A Schatzki ring is a specific type of "esophageal ring". Schatzki ring is described as a circular membrane of submucosa or mucosa or appear as a thin membranous structure that does not contain any muscularis propria. It is restricted to squamocolumnar junction at the esophagogastric junction [3-11]. In this article, we will discuss Schatzki ring as a cause of dysphagia, its symptoms, associated presentations, differential diagnosis, treatment, and management.

What is Schatzki ring?

Schatzki ring may be a benign, thin, circular membrane and submucosal membrane seen at the squamocolumnar junction of the distal passageway that doesn't contain muscularis propria [1]. Since the Fifties, many investigators have revealed reports of patients with upset United Nations agency had associated lower muscle system round constrictions, however, every investigator had a unique opinion on the cause and nature of those rings. In 1953, In-gel finger Associate in Nursing Kramer believed that these rings occurred as a result of a contraction by a hyperactive band of muscle system muscle [2]; but Schatzki and urban center believed that these rings were mounted and not contracted. Narrowing of the distal muscle system could also be secondary to Schatzki's ring. Schatzki's ring may be a membrane and sub-mucosal shelf placed at the squamocolumnar junction and normally related to a hernia.

The designation is often created employing a distinction higher gastrointestinal study. The ring could also be simply incomprehensible on higher scrutiny. the bulk of patients don't have any symptoms however some patients gift with solid food disorder, regurgitation, and occasional food impaction. Schatzki's ring will cause nighttime acid reflux connected symptoms. this can be thanks to digestive juice pooling within the muscle system secondary to passageway obstruction. Pooling happens at midnight as a result of gravity drives stomachic content into the muscle system particularly within the presence of a hernia. There are three types of esophageal rings, which are A rings, Brings, and C rings [12]. A ring is a muscular ring. B ring is a mucosal ring also known as Schatzki ring, and C ring is diaphragm indentation. Schatzki ring is most confused with A ring. A ring is most common in children, whereas a B ring is most common in adults. A ring occurs by contraction of an overactive band of esophageal muscle, whereas a B ring is believed to be fixed and non-contractile (Figure 1).

Etiology

Gastroesophageal reflux malady is believed to be associated with an associate degree hyperbolic risk of Schatzki rings thanks to continual acid exposure at the lower muscular structure [13,14]. This correlation will be supported by the very fact that patients with Schatzki rings if receive combined treatment of dilation and acid suppression square measure at a far lower risk of ring repetition no matter having esophageal reflux malady. Schatzki ring is commonly seen in patients diagnosed with hiatus hernia. Gastroesophageal reflux disease is associated with Schatzki ring. In GERD, among several other proposed theories, one states that the Schatzki ring is our body's defense mechanism against the development of Barrett's

esophagus. Another study confirmed that almost all patients with Schatzki rings have so a point of acid reflux even though they are doing not have the opposite typical symptoms of oesophageal reflux malady. Finally, it's been found that the danger of ulceration formation within the lower muscular structure will be joined to the presence of Schatzki rings.

Epidemiology

Schatzki ring is said to be found in 6-14% routinely done barium radiographic studies. Although there is no reliable data to conclude the prevalence of Schatzki's ring in the general population. There is no relationship with sex, age, race bias seen in the Schatzki ring.



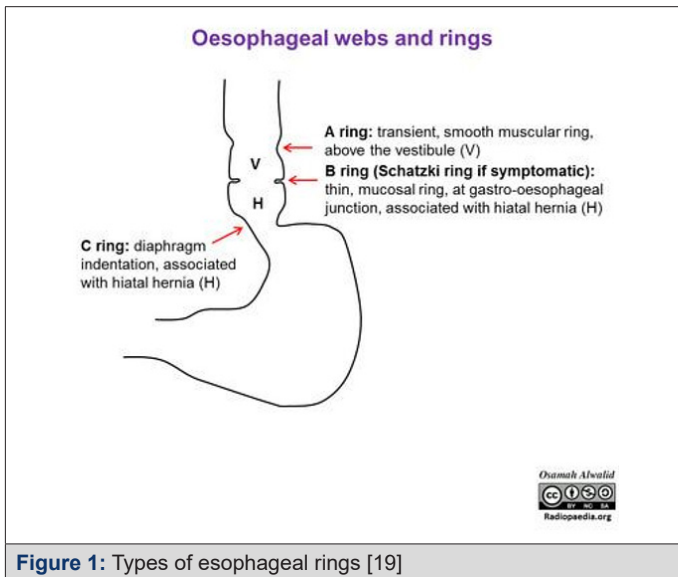


Figure 1: Types of esophageal rings [19]

United States data

Schatzki ring is commonly found and can be found in patients undergoing routine number with swallow studies; however, few of these patients exhibit any symptoms of upset [1,4,7]. No well-known population studies exist for its prevalence to the overall population. In retrospective review (2003-2018) of esophageal foreign body impaction (EFBI) at a single US institution, investigators analyzed data from 204 patients found structural causes were the most common etiology, with benign strictures and stenosis in 21.5% of patients, followed by Schatzki ring (7.8%) and hiatal hernia (6.9%).

Pathophysiology

The pathogenesis of the Schatzki ring is unclear with several conflicting hypotheses. Following are some of the hypotheses proposed as the cause of the Schatzki ring.

- 1) Ring is a pleat of redundant mucosa that is formed when the esophagus shortens overtime or permanently for unknown causes.
- 2) Congenital- Ring present since birth
- 3) Drug-induced esophagitis. (In one study, it has been found that 62% of the patients with Schatzki ring has taken drugs that are known to cause drug-induced esophagitis)
- 4) Short peptic stricture formation because of Gastroesophageal reflux disease- It has been hypothesized that the Schatzki ring acts as a protective mechanism against the worsening of the disease.

Some suppose that Schatzki's rings area unit a noninheritable malformation whereas others link ring formation to acid reflux. The very fact that the majority of patients with passage rings gift once they area unit quite forty years recent points additional

towards associate degree noninheritable condition. I feel with acid reflux the Z line or squama-columnar junction tends to maneuver in a very cephalad direction [15]. because the Z line retracts quicker than the underlying longitudinal passage muscle has time to shorten, a mucosal/submucosal ridge develops on top of the diaphragm. As a result, the stomachic mucous membrane herniates on top of the limb level forming a sloppy herniation that's ordinarily related to Schatzki's ring. each Schatzki's ring and a concomitant sloppy herniation could have constant etiology: GERD. In different words, herniation development during this model is presumably secondary to GERD. GERD in any case could be achromic and progressive complex malady [16]. the buildup of assorted insults to the gastro-esophageal junction transforms physiological reflux into GERD and culminates in the event of a herniation. A herniation additional exacerbates GERD and perpetuates the matter of reflux in a very vicious circle that's solely broken by herniation repair and Nissen fundoplication surgery.

Dr. Richard Schatzki created the "Schatzki rule" based on the diameter of the ring, which states that.

- <13 mm, it is always symptomatic.
- Between 13-24mm, maybe symptomatic
- >24 mm always asymptomatic

Symptoms

Most commonly patients' presentation is asymptomatic. Among the patients who have symptoms, acute dysphagia because of food impaction is the most common. Intermittent, episodic, non-progressive dysphagia to solids. Usually, patients do not present with dysphagia to liquids. The patient might remain asymptomatic for months to years together. Dysphagia to meat and bread (especially freshly cooked), appears to be common foods that precipitate symptoms of Schatzki ring. Patients who mostly develop symptoms are rapidly eating meat and drinking alcohol at a restaurant; therefore, it's related to steakhouse syndrome. The severity of the symptoms is associated with the diameter of the ring, Diameter less than 13 mm is mostly likely to cause symptoms. A large bolus of food gets impacted in the esophagus. Loss of weight because of dysphagia and impaction of food can be seen. Esophageal perforations are extremely rare.

Differential Diagnosis

Will include other causes of dysphagia:

- Esophageal strictures
- Eosinophilic esophagitis
- Reflux esophagitis
- Motility Disorder

- Malignancy
- If involves chest pain, should also consider:
 - candida esophagitis
 - pill esophagitis
 - radiation-induced esophagitis
 - esophageal rupture

Diagnosis

The most sensitive test to diagnose the Schatzki ring is the barium swallow study. It is considered better than double-contrast radiography or upper gastroesophageal endoscopy. The sensitivity of barium swallow study can be increased by performing Valsalva maneuver, by use of barium tablet or coated marshmallows. A good barium Swallow study will reveal a circumferential shortening at the gastroesophageal Junction. It is recommended to perform a biopsy if any irregular Z-line is found on upper GI endoscopy to rule out any malignancy. Biopsy of the ring can be done as both diagnostic and therapeutic [17]. In the case of incidental finding of Schatzki ring in asymptomatic patients, treatment is not needed until symptoms occur. Endoscopy may be conjointly useful within the diagnosing of Schatzki rings and in excluding different diagnoses like strictures, inflammation, ulcers, or malignancy. The figure shows however a Schatzki ring feels like on associate scrutiny. If a diagnostic test is performed of the Schatzki rings, the ring is going to be found to encompass mucous membrane and connective tissue however while not a muscular element.

Treatment and Management

The treatment strategy for the management of the Schatzki ring is to reduce the diameter of the ring to allow unobstructed passage of food through the esophagus. Surgical intervention includes

using dilators, bougies, balloons, four-quadrant biopsy, diathermic monopolar incision. Dilatation can be done with the savory dilator, which is with a help of a guidewire, Maloney dilator which is without the use of guidewire, or Pneumonic balloon dilator. The best treatment for a Schatzki ring involves using a French mercury bougie or a balloon to dilate the muscle system and destroy the ring. The dilation has to be compelled to be sturdy enough to really destroy the ring's structure and not merely stretch it [18].

The next step inside the management of Schatzki rings is to go to a baryon pump matter and to sharply treat reflux ill health. The combined regime of acid suppression and dilation has been found to significantly lower the danger of ring repetition compared to dilation alone. Unfortunately, Schatzki rings unit known to be continual but fortuitously they respond well to perennial dilation treatment. Patients generally gift with a continual disorder that is all over again for solids and not liquids. If the patient presents with quite a pair of recurrences, he or she may like larger gas balloons dilation treatment. Before creating an endeavor to regulate, different causes of disorder must be compelled to be excluded.

A newer approach is examination cauterization. in an associate extremely irregular controlled trial, it fully was found that assay of the ring inside the four quadrants throughout scrutiny can relieve disorder as equally as dilation. Despite having a similar effectuality, the examination procedure was delineated as higher tolerated once place next to dilation treatment. For patients with further severe ill health that is not alert to dilation treatment or scrutiny intervention, electrosurgical incision of the ring square measure is usually tried. This procedure was found to be a lot of sensible than dilation in delaying the repetition of disorder. Finally, patients with continual and symptomatic Schatzki rings can bear a full ring excision exploitation large cold assay extractor and scrutiny. The procedure seems to be attainable and is taken under consideration as safe with no serious complications.

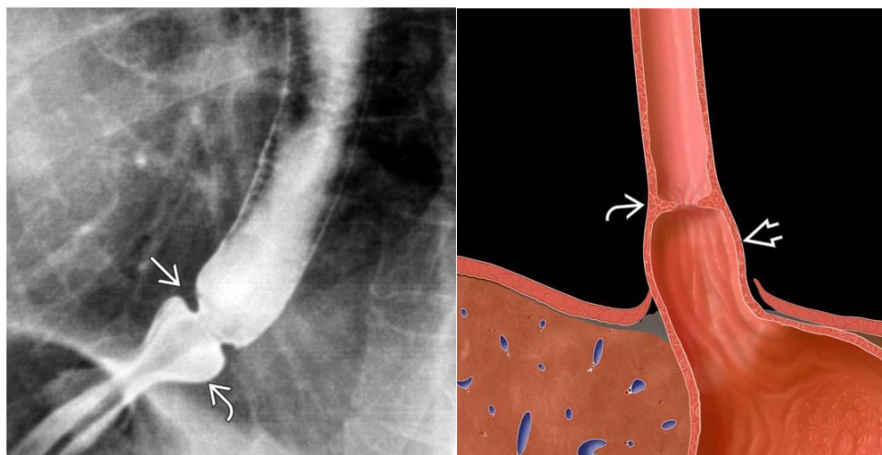


Figure 2: Radiologic Image of Schatzki ring [19].

A retrospective cohort study where 9 patients were considered subjects, revealed the effectiveness of proton pump inhibitors in patients with Schatzki ring. Patients were treated with a proton pump inhibitor for 10 months. The change in lumen diameter before and after treatment was determined using a barium swallow study by the ability to pass a 13mm barium capsule. This study concluded that the median ring diameter was 10 mm before treatment and 15 mm after treatment with proton pump inhibitor. Therefore, patients can be started on proton pump inhibitors like omeprazole 20-40 mg. Fundoplication can also be considered to counter the symptoms caused by Gastroesophageal reflux disease (Figure 2).

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