

# Toxic Shock Syndrome Following Endoscopic Surgery

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## Endoskopik Cerrahi Sonrası Toksik Şok Sendromu

Toksik şok sendromu (TSS) seyrek görülen, hayatı tehdit edici, genellikle ani ateş yükselmesi, yaygın güneş yanığı tarzında eritroderma ve birçok organın yetersizliği ile ani hipotansiyon ve şok geliştirebilen değişik semptom ve belirtilerle karakterize bir durumdur.

TSS'nin burun cerrahisi sonrası nazal tampon kullanılsın veya kullanılmıyorsa meydana gelebileceği bildirilmiştir.

Burun cerrahisinin iyi bilinen bir komplikasyonu olan bu sendrom herhangi bir *Staphylococcus aureus* enfeksiyonu sonrası gelişebilir. Çok nadir görülmesine rağmen KBB hekimlerinin bu sendromla ilgili bulgu ve belirtilere karşı uyanık olması ve tedavisine de hakim olmaları gerekmektedir. Erken farkına varma ve anında müdahale TSS ile ilişkili morbidite ve mortalitenin en aza indirilmesinde önemli bir rol oynar. Burun cerrahisi sonrası Merocel nazal tampon uygulanmış bir hastada görülen klasik bir TSS olgusunu literatürü ve tedavisini gözden geçirip sunuyoruz.

**Anahtar Sözcükler:** Toksik şok sendromu, *Staphylococcus aureus*, endoskopik sinüs cerrahisi.

## Abstract

Toxic shock syndrome (TSS) is a rare, life threatening condition usually characterized by sudden onset of high fever, diffuse sunburn-like erythroderma and a variety of other signs and symptoms that may progress rapidly to hypotension and shock with multiple organ failure. TSS has been rated to occur with nasal surgery with and without packing.

The disease may occur following any infection with *Staphylococcus aureus*, a well-documented complication of nasal surgery. Although the disease is very rare, all the otolaryngologists should be aware of the manifestations of this disorder and its treatment. Early recognition and prompt intervention plays an important role in minimizing the morbidity and mortality associated with TSS. We present a case of TSS in a patient who had nasal surgery with subsequent packing of the nose with Merocel nasal tampons along with a review of the literature and its management.

**Key Words:** Toxic shock syndrome, *Staphylococcus aureus*, endoscopic sinus surgery.

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## Introduction

Toxic shock syndrome (TSS) is a rare, acute illness usually characterized by sudden onset of high fever, vomiting, diarrhea and muscle ache, followed by hypotension and in severe cases by shock. Desquamation, especially of the soles and palms and sunburn like rash occur during the acute phase.<sup>1,2</sup>

Toxic shock syndrome was first reported by Todd et al. in 1978 among seven children. A similar condition described in 1927 by Stevens, that probably was not the same illness, since his cases involved deep-tissue infection with *Staphylococcus aureus*, whereas today TSS appear to be a toxemic disease related to colonization or superficial infection due to *Staphylococcus aureus*.<sup>3</sup>

Since 1978, most of the TSS cases were in menstruating females who were using tampons. More recently, it has been noted that the disease may occur in males and females with focal, superficial infection due to *Staphylococcus aureus*. TSS has been described after a variety of surgical procedures, including intranasal surgery such as septorhinoplasty and functional endoscopic sinus surgery. The occurrence of TSS following nasal surgery has generally been associated with the use of some absorbent tampon like packing made from synthetic materials. High absorbency tampon use is associated with an increased risk for developing TSS. The reported incidence of TSS after nasal surgery is 16 cases per 100.000 patients. Otolaryngologists should be aware of the manifestations and treatment of this life threatening condition.<sup>1,2,4</sup>

We present a case of TSS after functional endoscopic nasal surgery and partial turbinectomy along with a review of literature and its management.

### Case Report

A 16 year-old boy underwent an uncomplicated functional endoscopic nasal surgery with bilateral partial turbinectomy and was discharged from the hospital with a packing of Merocel nasal tampons without antibiotic therapy. The patient was asked to come back for packing removal after 2 days of the procedure. He was only prescribed some painkillers as needed.

Within 48 hours the patient was brought to the hospital because of sudden onset of fever, diarrhea and vomiting. There was no history of recent travel or outdoor activities. The patient was found to be hypotensive in the hospital. The temperature was 38.9°C and his blood pressure was 85/50 mmHg. Pulse rate was 130 beats per minute and a diffuse sunburn-like rash involving the face, trunk and abdomen was noticed. The nasal packs removed and the nasal cavity was noted to be bloodied with some mucosal inflammation but without purulent

discharge. There was no postnasal purulent discharge either. Findings during the remainder of the physical examination were within normal limits. A diagnosis of toxic shock syndrome was suspected and the patient admitted to the hospital.

Laboratory examination revealed a white blood cell count (WBC) of 15.000 cells/mm<sup>3</sup> with 65% neutrophils, 27% bands and 3% lymphocytes. Hematocrit was 32% and the hemoglobin was 13 g/dl. Serum creatinine, serum urea nitrogen, serum proteins and electrolytes were within normal limits. The patient was treated with intravenous fluid administration and intravenous antibiotic therapy with Cloxacillin (2 gr. every 6 hours) and ceftriaxone (1 gr. every 12 hours) to provide coverage for TSS and sinusitis. A dopamine drip was also started to maintain blood pressure. The patient improved rapidly and was afebrile within 24 hours. By the third day, the patient's hands and feet began to desquamate. Cultures from the nose demonstrated *Staphylococcus aureus* while blood cultures were sterile. The patient was discharged on the fourth day to complete a 7-day oral course of cloxacilline (500 mg four times a day) and recovered completely without sequel.

### Discussion

TSS is a life threatening illness that involves multiple organ systems in the body caused by *Staphylococcus aureus*. It was first described in children who have had community acquired infections. Although it was predominantly described as a disease of menstruating woman, TSS is now recognized to occur after a variety of surgical procedures, including intranasal operations.<sup>1</sup> For TSS to occur after nasal surgery, a number of events must coincide. First, an individual must be infected with exotoxin-producing *Staphylococcus aureus*. Next, there must be some alterations in the integrity of the mucosal membrane at the site of infection. In addition, the individual must lack antibody to the toxic shock toxin. The bacterial endotoxin can enter into bloodstream through a mucosal break, but the source of contamination is often uncertain. Local conditions, such as packing, stenting, neutral pH and an aerobic environment appear to increase the possibility of TSS, but the exact role still remains unclear. Jacobson and Kasworm (1986) noted three cases of TSS that patients had the typical symptoms and signs of TSS and had the onset of

the disease within 24 hours after surgery, but did not have grossly infected surgical sites. They were unable to demonstrate an association between nasal packing and the development of TSS.<sup>2,4,5</sup>

TSS after nasal surgery was first reported by Thomas in 1982.<sup>6</sup> Barbour et al. reported a case of TSS associated with rhinoplasty in which an analog was made between the nasal packing and a vaginal tampon.<sup>7</sup> Others have reported TSS in nasal surgery where no packing was used.<sup>8</sup> Our case also had a nasal packing but not with the standard gauze material. Merocel nasal tampons, a lint-free synthetic surgical sponge, composed of an open cell foam polymer of hydroxylated polyvinyl acetyl, was used to pack both nares postoperatively.<sup>9</sup>

Prophylactic antistaphylococcal antibiotics appear to be ineffective in preventing TSS. This has been demonstrated by numerous case reports of TSS that have occurred despite appropriate antibiotic treatment.<sup>10</sup> In addition, prospective analysis of prophylactic antibiotic therapy has shown to have no effect on the nasal carriage rate of *Staphylococcus aureus*.<sup>11</sup> As it is stated in the literature data, prophylactic antibiotic use is open to discussion, if pre- or postoperatively no signs of infection like, fronculitis or no purulent discharge is seen. In respect to these data we have not given prophylactic antibiotics to our patients for one year and except in this particular case we didn't observe any similar complication.

Because of the rapidly progressive, multisystemic nature of TSS, early recognition and prompt intervention are required to minimize morbidity and mortality. Treatment should include elimination of the focus of infection by removing the contaminated foreign body. Supportive medical care often requires vigorous administration of intravenous fluids and, if necessary, vasopressors to correct hypotension. Antistaphylococcal antibiotics reduce the risk of recurrence of TSS but do not affect the toxin already elaborated. Retrospective analysis suggests that administration of corticosteroids within 2 to 3 days of onset reduces the severity of illness and the duration of fever.<sup>2</sup>

Our patient clearly represented a case of TSS associated with the use of the Merocel nasal tampon. This report demonstrates the need for removal of nasal packing immediately.

Because the pathogenesis of TSS is still not completely understood and no specific laboratory test exists to define the condition, the diagnosis must be based on clinical manifestations and the physician's judgment. The low incidence of TSS after nasal surgery should remind all otolaryngologists of the necessity of suspecting the disease as a potential postoperative complication of nasal surgery. Early recognition and prompt intervention will continue to play an important role in minimizing the morbidity and mortality associated with TSS.

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