

# **TOXIC SHOCK SYNDROME FOLLOWING FUNCTIONAL ENDONASAL SINUS SURGERY: A CASE REPORT**

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## TOXIC SHOCK SYNDROME FOLLOWING FUNCTIONAL ENDONASAL SINUS SURGERY: A CASE REPORT

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Toxic shock syndrome (TSS) is a serious multisystem disease that was first described in 1978 by Todd. It occurs most often in menstruating women using superabsorbent tampons. The exact pathogenesis is not well understood, but it is felt to be due to the effects of an enterotoxin produced by certain strains of *Staphylococcus aureus*. The reported incidence of TSS following nasal surgery is 16/100,000. We report a case of TSS following endonasal sinus surgery in which minimal packing was used. The nasal surgeon should be aware of this rare and possibly fatal entity, as TSS may occur following any nasal/sinus surgery, even where packing is minimal and of short duration and when the patient is receiving antibiotic therapy. **HEAD & NECK 1991;13:247-248**

**T**oxic shock syndrome (TSS) may follow any surgical procedure in which packing is used. The nose is one of the surgical sites in which toxic shock syndrome toxin-1 (TSST-1)-producing *Staphylococcus* have been described.<sup>1-3</sup> We report a case in a young woman rapidly following functional endonasal sinus surgery. The patient had no signs of wound infection but presented with the 4 major criteria of TSS: fever of 39.5°C, exanthem with erythroderma, subsequent desquamation, and orthostatic hypotension.<sup>4</sup>

Toxic shock syndrome is a serious acute illness that should be suspected in any postoperative patient presenting with high-grade fever and hypotension.

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### CASE REPORT

A 32-year-old woman underwent functional endonasal sinus surgery (FESS) for polypoid chronic sinusitis. Preoperative evaluation was negative for any medical problem except for chronic sinusitis. The patient had a 1 × 2 inch piece of gelfilm wrapped around a piece of gel-foam shaped into a cigarette-type pack. This was inserted into her left ethmoid region. No other packing was used. Postoperatively, the patient was observed for several hours with no complications and was discharged on antibiotics.

Approximately 18 hours later, the patient was seen in our clinic with the history of several episodes of vomiting, persistent nausea, abdominal pain, and undocumented high fever. While removing the pack in the office, the patient experienced a syncopal episode and her blood pressure was 60/40 mmHg. She was admitted to the hospital immediately, and an infectious disease consult was called.

Examination revealed a pulse of 130/min, temperature of 39.5°C, and respiratory rate of 24/min. She was hypotensive with a blood pressure of 60/0 mmHg on admission. Intravenous fluids increased her blood pressure to 80/40 mmHg. She was in acute distress with diffuse macular erythematous rash involving chest, abdomen, and face. Her otolaryngologic exam revealed diffuse oral and pharyngeal mucosal bullous erythema and petichael formation. Her abdomen was tender. However, the rest of her exam was within normal limits. Her laboratory findings revealed a blood urea nitrogen of 24 mg/dL, calcium of 3.8 mg/dL, and a creatinine of 2.3 mg/dL, electrolytes, liver function tests, complete

blood count, platelet count, and serology titers were normal. Her electrocardiogram and chest x-ray were also normal. Blood, stool, and nasal cultures were taken. These were negative except for the nasal culture that grew *Staphylococcus aureus* coagulase positive.

Presumptive diagnosis of TSS was made, and the patient was admitted to the intensive care unit. Vigorous fluid resuscitation with monitoring of vital signs, urine output, and central venous pressure were started. Vancomycin and Fortaz were also started intravenously. She responded very well to the management and was transferred to a regular nursing unit 2 days later. On the sixth hospital day, the patient was discharged on dicloxacillin for 5 days.

## DISCUSSION

Toxic shock syndrome is a serious acute illness that might have a fatality rate as high as 10%.<sup>5</sup> It usually involves multiple organ systems in the body.<sup>6</sup> It was predominantly reported in young menstruating women using tampons; however, as awareness of this entity increased, many reports appeared related to surgical wounds, especially in cases of nasal surgery.<sup>7-9</sup>

The essential organism for TSS production is a TSST-1-producing *Staphylococcus aureus*. Although the incidence of *Staphylococcus aureus* nasal carriers in normal volunteers was reported to vary from 18%<sup>4,10</sup> to 50%.<sup>4,11</sup> Fortunately, TSS incidence following nasal surgery is as low as 16/100,000.<sup>8</sup>

The exact reason why TSS occurs is not well understood. Certain *Staphylococcus* isolates are needed to produce TSST-1 leading to TSS. This toxin was found in more than 90% of *Staphylococcus* strains in patients with TSS and in less than 10% of *Staphylococcus* isolates not associated with TSS.<sup>10</sup> Packing is another major contributing factor but the exact role of packing and packing material is unclear.<sup>8,12</sup> Additionally, the role of mucosal damage and trauma remains a mystery.

In our case, even though minimal unilateral packing was used, TSST-1 was produced leading to TSS. Gelfoam could have been the major contributory factor, because it has a high rate of *Staphylococcus aureus* growth as reported by Breda et al.<sup>4</sup>

Prophylactic antibiotics (as noted in this case and other reports<sup>4,8</sup>) have no beneficial effect. This is thought to be because of the low blood levels of antibiotics in recently operated areas as reported by Hoepflich.<sup>13</sup>

## CONCLUSION

Toxic shock syndrome is not limited to menstruating women using tampons. Seven cases of TSS were reported following nasal surgery between 1980 and 1983.<sup>8</sup>

We recommend against the use of packing material following sinonasal surgery. However, if minimal packing must be used we believe this should be coated with antibiotic ointment. Bacitracin has been shown to be effective against *Staphylococcus aureus*.<sup>14</sup>

## REFERENCES

1. Toback J, Fayerman JW. Toxic shock syndrome following septorhinoplasty. *Arch Otolaryngol Head Neck Surg* 1983;109:627-629.
2. Reingold AL. Toxic shock syndrome in the United States of America. *Epidemiology. Postgrad Med J* 1985;61 (Suppl):23-24.
3. Bartlett P, Reingold AL, Graham DR, et al. Toxic shock syndrome associated with surgical wound infection. *JAMA* 1982;247:1448-1450.
4. Breda SD, Jacobs JB, Lebowitz AS, Tierno PM. Toxic shock syndrome in nasal surgery: a physicochemical and microbiological evaluation of Merocel (R) and Nu Gauze (R) nasal packing. *Laryngoscope* 1987;97:1388-1391.
5. Glasgow LA. *Staphylococcus* infection in the toxic shock syndrome [Editorial]. *N Engl J Med* 1980;303:1473-1475.
6. Chesney PJ, Davis JP, Purdy WK, Wand PJ, Chesney RW. Clinical manifestations of toxic shock syndrome. *JAMA* 1981;246:741-748.
7. Thomas SW, Baird IM, Frazier RD. Toxic shock syndrome following submucous resection and rhinoplasty. *JAMA* 1982;247:2402-2403.
8. Jacobson JA, Kasworm EM. Toxic shock syndrome after nasal surgery. Case reports and analysis of risk factors. *Arch Otolaryngol Head Neck Surg* 1986;112:329-332.
9. Reingold AL, Dan BB, Shands KD, Broome CV. Toxic shock syndrome not associated with menstruation. A review of 54 cases. *Lancet* 1982;2:1-4.
10. Shands KN, Schmid GP, Dan BB, et al. Toxic shock syndrome in menstruating women. Association with tampon use and *Staphylococcus aureus* and clinical features in 52 cases. *N Engl J Med* 1980;303:1436-1442.
11. Chesney PJ, Bergdoll MS, Davis JP, et al. The disease spectrum, epidemiology and etiology of toxic shock syndrome. *Ann Rev Microbiol* 1984;38:315-338.
12. Stucker FJ, Ansel DG. A case against nasal packing. *Laryngoscope* 1978;88:1314-1317.
13. Hoepflich PD. Prediction of antimeningo cocci chemoprophylactic efficacy. *J Infect Dis* 1971;123:125-133.
14. Jawetz E. Polymyxin, colistin and bacitracin. *Pediatr Clin North Am* 1961;8:1057-1064.