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Thoracic Spine Deformity Post Tetanus: A Case Report of Tetanus Post Circumcision

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ABSTRACT

Tetanus is caused by clostridium tetani bacteria through skin breach. The tetanus is characterized by tonic contraction and muscle spasm which can cause vertebral fracture in some patients.

we are reporting a young male patient who after ring circumcision technique had tetanus complicated into thoracic vertebral fracture with severe kyphotic deformity and lower limb functional impairment.

The surgical management was performed in two stages: First stage consisted of Shwab 2 osteotomy, pedicle screws and rod fixation with good result for deformity correction.

The second stage of surgery involved left transpedicular T6 and T5 corpectomies (Shwab 3 osteotomy) plus interbody titanium cage fixation which provided good spinal cord decompression.

Tetanus is still a major complication of circumcision, tetanus complication may be devastating

Early surgical deformity correction and spinal cord decompression provide favorable neurological and functional outcome for patients with spine deformity post tetanus. The Patient was able to walk with crutches 3 months post-surgery.

ARTICLE DETAILS

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INTRODUCTION

Tetanus is a nervous system disorder characterized by muscle spasms, is an acute acquired infection caused by spore of the clostridium tetani bacteria inoculated to human body through a skin breach, cut or wound with incubation period of 8 days (1)

The most common clinical presentation is generalized tetanus described as tonic contraction of the skeletal muscles and intermittent intense muscular spasms, they are triggered by noise, sensory stimulus or light.

The most classic clinical findings of tetanus are: Neck stiffness, opisthotonus, board-like rigid abdomen, periods of apnea and/or upper airway obstruction due to vise-like contraction of the thoracic muscles and/or glottal or pharyngeal muscle contraction and dysphagia.

The diagnosis of tetanus is made on clinical base of signs and symptoms. Tetanus is likely when there is generalized muscle contraction, muscle spasms with an antecedent tetanus-prone injury and a history of inadequate immunization for tetanus (2).

Vaccination has dramatically decreased the cases of tetanus; majority of tatanus infection reported in newborns, mothers and trauma patients who did not receive tetanus toxoid vaccine. The data from the global burden of disease survey, an estimated 48,000 to 80,000 deaths occurred from tetanus worldwide in 2016. Majority were patients above 5years (3).

The mortality rate of 3043 adult African patients reported in 27 studies was 43%. The high rate of mortality was explained by lack of mechanical ventilation. (4)

The complications related to tetanus are sometimes devastating. Sigrid et al report Pressure ulcers were the most common complication (38,1%) followed by arrhythmias 28.6% and bone fractures secondary to tetanus spasms 9.6% (5)

Vertebral fracture from tetanus is often undiagnosed. The spine deformity post tetanus is a resultant of force which occurs during contraction of certain muscle groups during tetanic convulsions (6). We are reporting an uncommon case of a young adolescent who got severe thoracic kyphosis deformity as complication of generalized tetanus muscular contraction after circumcision, two staged surgical management of thoracic deformity and patient outcome after surgery are reported.

CASE PRESENTATION

He is 16 years old, high school boy who presented with Progressive lower limb weakness and spine deformity for 1 month. The symptoms started with lock jaw, tonic contraction of skeletal muscles and intermittent intense muscular spasms which started 10 days after of ring circumcision. He was hospitalized in another hospital in Intensive care Unit for cardio -respiratory support and control of generalized tetanus.

The patient was referred to us for progressive spine deformity and lower limb weakness secondary to thoracic spine fracture post tetanus. There was no other medical and surgical history relevant to his condition and was vaccinated for tetanus at early childhood.

PHYSICAL EXAM

Stable patient without signs of cardio-respiratory compromise.

General status was altered by muscle wasting, he was bed ridden not ill looking. The positive findings were on lower limbs examination: motor power was 1/5 in all Right Lower Limb and left Lower Limb myotomes, negative clonus, and no fasciculation. Tendon reflexes were 1+ for patellar and achilles tendons bilaterally. Sensory function to pain and temperature was conserved; he had decreased sensation of lower limbs to light touch up to nipples level, position and vibration sensation of lower limbs were absent, Gait not tested and not able to examine coordination for lower limbs. He had a normal anal tone and able to control urine

Pre-operative imaging:

Image A Image B

Image A and Image B: These are T2W and CT scan sagittal images respectively showing Compression fracture of T4, T5 and T6 vertebral body with retropulsion of fracture segments and severe kyphosis deformity causing spinal cord compression.

SURGICAL MANAGEMENT

The goals of surgery were: to improving patient neurological function, to prevent progression of neurological deterioration, to prevent respiratory compromise and to correct thoracic kyphosis deformity.

The surgery was tailored in two stages: First stage consisted of shwab 2 osteotomy, pedicle screws and rod fixation from T1 to T10 with acceptable kyphosis deformity correction as result of surgery, but control MRI after the first stage showed, there was still spinal cord compression, reason why we did second stage of surgery consisting of left transpeducular T5 and T6 corpectomies

(Shwab3 osteotomy) plus interbody titanium cage fixation (T4/T7).

After First stage surgery control imaging:

Image C **Image D** **Image E**

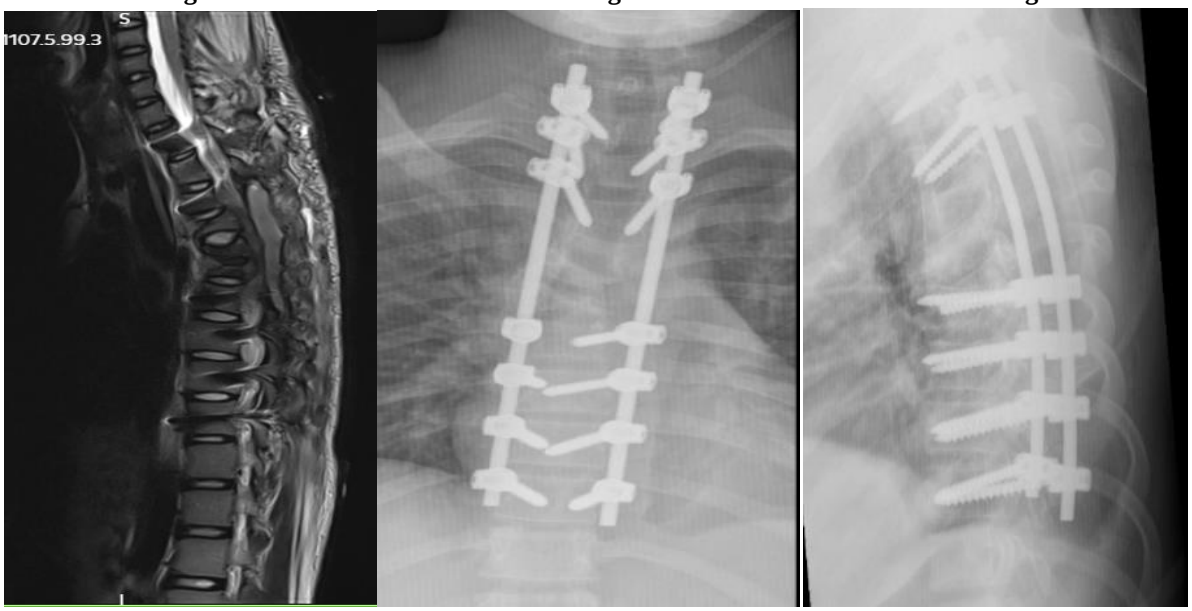

Image C, Image D and Image E: Sagittal T2W MRI, AP and lateral thoracic spine x rays respectively showing control result of first stage of surgery, Shwab 2 osteotomy,pedicle screw/rods fixation from T1 to T10. The allow showing spinal cord compression at T5/T6 level.

Image F **Image G:**

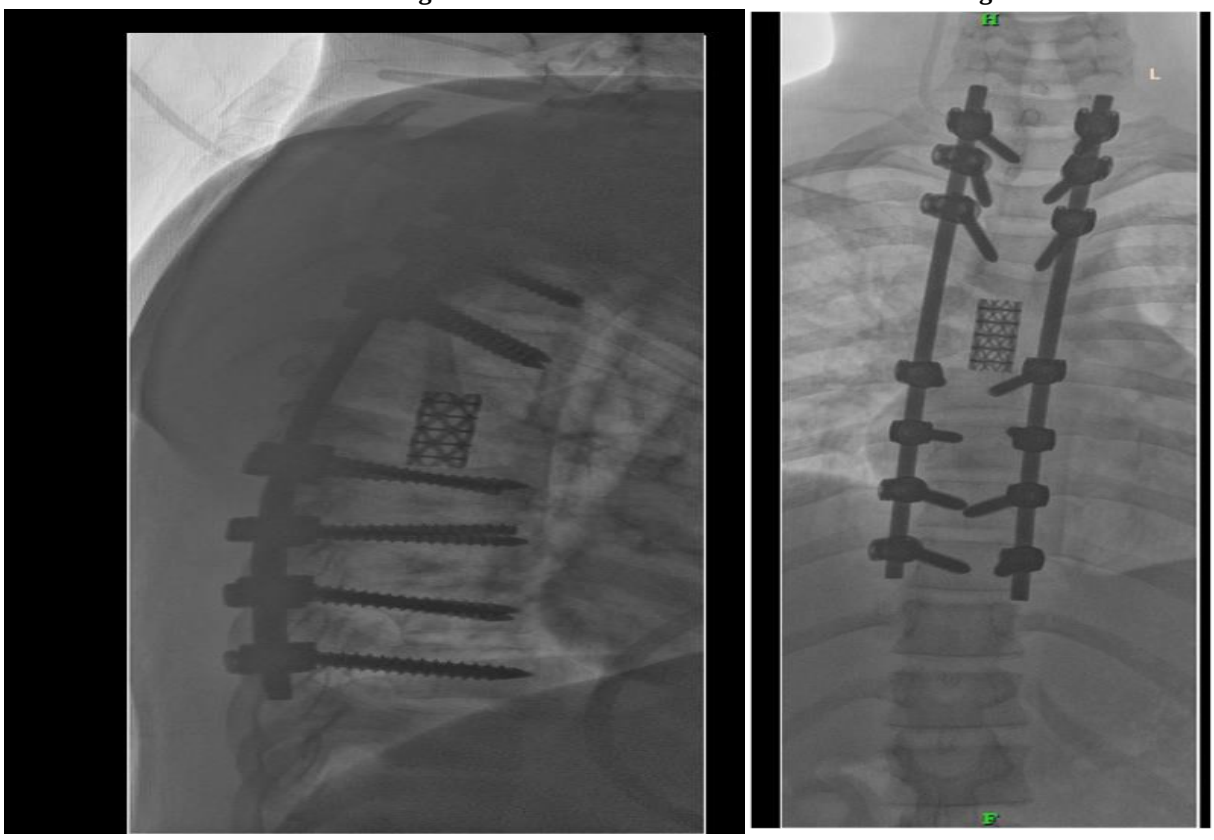

Image F and Image G: AP and Lateral thoracic rays after the second stage of surgery Left transpedicular T6 and T5 corpectomies (Shwab 3 osteotomy) plus titanium cage fixation.

OUTCOME

Surgery was uneventful, on day 7 post surgery the patient lower limb motor power has improved from 1 to 3 with full recovery of sensory function of lower limbs and conserved normal function of sphincters. The patient was referred to a rehabilitation center after 14 days of hospitalization. 3months after surgery patient was able walk with crutches

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Patient picture after 3 months post-surgery. Able to walk with of crutches.

DISCUSSION

The case we are reporting is particular in current literature describing the surgical correction of thoracic spine deformity in patients with kyphosis secondary to tetanus after circumcision. A rare cause of severe spine deformity resulting in neurologic deficit. The first case report of spine fracture related to tetanus was reported by Lehndroff in 1907(6). Roberg J.R reported that spine kyphotic deformity may follow tetanus, with or without demonstrable fracture of the vertebral bodies (6). Cornelius C report of compression fractures of the thoracic vertebra in patients with tetanus in 1959(7), Davis PR et al report of vertebral fractures in West Africans suffering from tetanus (8). The recent literature report was in 2013 in Niger by Nte AR Gabriel-job N reporting a 13-year-old girl with tetanus with multiple wedge vertebral collapses (9). There is evidence of decrease in tetanus complication throughout time due to tetanus vaccination or lack of reporting. The case we are reporting is particular in literature; first, because it is the only describing circumcision as the source of entry of tetanus complicating into spine deformity, second it is describing surgical management in two-staged surgery for optimal deformity correction and neurological improvement. We are reporting this case as recall message for awareness of possible severe spine deformity which can occur with tetanus after circumcision. Although tetanus after Circumcision was reported in many studies, it can lead to disabling complications and death (10).

Staged thoracic deformity correction surgery is reasonable treatment paradigm when the result is not satisfactory like in our case where after the first surgery, despite good spine deformity correction the spinal cord decompression at T5 and T6 level was not satisfactory. The anterior decompression by T5 and T6 corpectomy through a posterior approach yield to good results and neurological improvement. Early surgical deformity correction and spinal cord decompression provided favorable outcome, the patient had progressive improvement from lower limb power of 1 grade as ASIA C before surgery and the patient was able to walk with crutches 3 months post-surgery. The overall recovery for ASIA C patients is about 75% (11).

CONCLUSION

Circumcision can be the source of tetani inoculation. Sterility and proper technique with trained medical personnel is the paramount in prevention of infection. Tetanus is associated with severe morbidity and mortality including spine fracture which can cause severe spine deformity and neurological deficit. Staged spine surgery is reasonable treatment option when the first results are not satisfactory. Early surgical deformity correction and spinal cord decompression can lead to a good outcome.

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