

## **Case Report: T4 Vertebral Fracture in an Obese Patient**

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Received: August 04, 2020

Published: August 24, 2020

### **Abstract**

**Introduction:** A vertebral fracture is an injury that can involve only the vertebral body or the entire functional vertebral unit. They are very frequent, it ranks second in the frequency of fractures, it is more frequent among men and between T11 and L1. They are usually accompanied by neurological deficit due to their proximity to the spinal cord. The diagnosis and management decision is made supported by a combination of plain radiographs, Computed Axial Tomography (CAT) and Magnetic Resonance Imaging (MRI). The therapeutic options include conservative and surgical treatment, in order to readjust the compressed vertebra and maintain its position until the consolidation.

**Case Report:** 51-year-old male patient, smoker 30 years ago, social alcoholism. Diabetic and hypertensive diagnosed 5 years ago with poor adherence to treatment, obese with a BMI of 41.5 who reported a fall of approximately 2.5 meters in height with a fall in the cephalic position, without loss of consciousness, reported severe pain in the spine in the thoracic region, in the shoulder left and head. A T3 vertebra fracture is diagnosed, which is operated on with arthrodesis in T2-T4 and T5, without complications and with a favorable recovery and evolution.

**Conclusions:** This was a complicated case due to its comorbidities, Diabetes Mellitus, Hypertension and Obesity with a BMI of 39.4. The amount of fatty tissue in the affected region made access difficult due to the lack of sharp images on the fluoroscope. Despite the imaging difficulties, the surgical intervention was carried out successfully and the patient had a successful recovery.

**Key words:** Vertebral Fracture; Osteosynthesis; Spine; Spine Surgery; Cervical Trauma

### **Introduction**

Vertebral fracture is an injury that can affect only the vertebral body or the entire functional vertebral unit. Fractures of the spine are very frequent, occupying the second place in frequency of fractures, more frequent among men with a ratio of 2: 3. The vertebrae most affected are those between T11 and L1 in 52% of cases, L2-L5 in 32% and T1 to T10 in 10% with a higher incidence between 25 and 40 years. The thoracic vertebrae are very close to the spinal cord, so the reserve space of the spinal canal is less than 10%. Thus, burst fractures of the thoracic spine are usually accompanied by neurological deficits.

### **Clinical Diagnosis**

Investigate mechanism of injury, comorbidities, search for associated spinal cord injuries, and exact assessment of the patient's neurological status.

### **Physical Examination**

The ASIA scale is used (modified Frankel).

### **Radiological Diagnosis**

The identification of vertebral fractures is important because they are predictors of future fractures.

The combination of plain radiographs, Computerized Axial Tomography (CT) and Magnetic Resonance Imaging (MRI) allows the identification of bone and ligamentous lesions of the thoracolumbar vertebrae. Allowing to identify unstable lesions and classify them to select the appropriate treatment.

### **Treatment**

The goal of treating spinal fractures is to readjust the compressed vertebra and maintain its position. Therapeutic options include conservative and surgical treatment. The main advantage of conservative treatment is the absence of morbidity associated with the access route, the short duration of hospital admission and the rapid referral to rehabilitation and lower costs, however, in thoracic vertebral fractures, it is indicated on few occasions. It can be considered for conservative treatment, when they are stable fractures and without neurological deficit.

The ultimate goal of surgical treatment for thoracolumbar fractures is to maximize function, prevent deformity, avoid instability and pain, and shorten days of hospitalization.

### Presentation of the Case

Non-pathological personal history: 51-year-old male patient, resident of Guadalajara, positive social tobacco, more than 30 years of having been an active smoker for two years, positive alcohol consumption for social reason without reaching delivery, drug consumption, tattoos, piercings denied in a type or positive drug intake metoprolol and losartan hydrochlorothiazide and application of insulin NPH. Pathological personal history: he refers to being a diabetic diagnosed 5 years ago on current treatment with nph insulin 34 units in the morning and 20 units at night, as well as hypertension diagnosed 5 years ago on treatment with irbesartan-hydrochlorothiazide and metoprolol with poor adherence to treatment. Rest questioned and denied. Current condition: He refers to a fall of approximately 2.5 meters in height with a fall in the cephalic position, without loss of consciousness, he refers to intense pain in the spine in the thoracic region, in the left shoulder and head.

Physical examination: Conscious, oriented and cooperative patient, Glasgow 15/15, showing pain fascies. Normal-looking skull with multiple lacerations and bruises. Normoreflexic pupils, reflexes preserved, without neurological alterations. Inability to ambulate and move left arm. Spinal pain at the thoracic level with intensity 10/10. Obese patient, with the presence of a very thick hump at the vertebral fracture level. Height 1.67 meters, weight 110 KG. BMI: 39.4 Surgical intervention: Under balanced general anesthesia, the procedure is started incising by planes until spinous processes are identified, pedicles are located and transparent screws are placed with fluoroscopic support in T2 T4 and T5, crossing and bone matrix are placed, hemostasis is performed, gania drainage is placed and closes by plans without incident. Ten days after the surgery, without complications, wandering, without referring severe pain and with good wound healing, he was discharged for follow-up in the neurosurgery outpatient clinic.

### Discussion

In the literature, it is mentioned that vertebral column fractures

are very frequent, being the second place in frequency of fractures, with a distribution of 2: 3 men and women. The least affected vertebrae are between T1 to T10 which represent only 10% and we find it in people between 25 and 40 years old. In recent years, evidence has been gathered that overweight and fat mass can have a negative influence on the risk of fracture, especially when adjusted according to the patient's bone mass. Obesity is an important risk factor for presenting multiple complications, pseudoarthrosis, increased bleeding during surgery, difficult surgical technique, failure in the evolution after degenerative spine surgery.

### Conclusion

Vertebral fractures are common, however, this patient's fracture height only corresponds to 10% of vertebral fractures. In addition, it is out of the most common age range for this condition. It was a complicated case due to its comorbidities, Diabetes Mellitus, Hypertension and Obesity with a BMI of 39.4. The amount of fatty tissue in the affected region made access difficult due to the lack of clear images in the fluoroscope. Despite the imaging difficulties, the surgical procedure was successful and the patient made a successful recovery.

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