



## RARE S4 FRACTURE WITH INTERESTING INJURY MECHANISM

### İLGİNÇ BİR YARALANMA MEKANİZMASI İLE GELİŞEN NADİR S-4 KIRIĞI

Ömer ERŞEN<sup>1</sup>,  
Burak BİLEKLİ<sup>2</sup>,  
Serkan BİLGİÇ<sup>3</sup>,  
Nuray CAN<sup>2</sup>,  
Erbil OĞUZ<sup>3</sup>

<sup>1</sup>Orthopedics and Traumatology,  
MD, TSK Rehabilitation Center,  
Ankara

<sup>2</sup>Orthopedics and Traumatology  
resident, MD, GATA Orthopedics  
and Traumatology Department,  
Ankara

<sup>3</sup>Orthopedics and Traumatology,  
MD, Assoc. Prof., GATA  
Orthopedics and Traumatology  
Department, Ankara

**Address:** Serkan Bilgiç,  
GATA Orthopedics and  
Traumatology Department. 06018  
Etlik / Ankara  
**Tel.:** 0312 3043076  
**Fax:** 0312 3045500  
**E-mail:** serbil11@yahoo.com  
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#### SUMMARY:

Sacral fractures due to direct trauma are very rare. Sacral fractures usually occur as a result of high energy trauma, and are accompanied by pelvic fractures in 40–50% of cases. With conventional radiological techniques, sacrum fractures can be overlooked due to intestinal gas, the shadow of the bladder or the shape of the sacrum itself. It needs to be kept in mind that 35% of sacral fractures can be overlooked in X-rays. In the presence of clinical suspicion, computerized tomography is needed for a diagnosis.

We report here the diagnosis by computerized tomography of a sacrum fracture of a 20-year-old man, who suffered from an S4 fracture with a rare mechanism of injury, and received conservative treatment.

**Key words:** Sacral fracture, direct trauma, diagnosis, treatment

**Level of Evidence:** Case report, Level V

#### ÖZET:

Direk travma sonrası görülen sakral kırıklar nadirdir. Sakral kırıklar genellikle % 40-50 oranında eşlik eden pelvik kırıklarla seyrederek ve yüksek enerjili travmalar sonrasında görülürler. Sakrum kırığının konvansiyonel radyolojik tetkiklerle değerlendirilmesi önündeki bağırsak gazı, mesane ve sakrumun açılanması nedeniyle zordur. Düz grafiyle sakrum kırıklarının % 35'i gözden kaçırılabilir olduğu unutulmamalıdır. Şüpheli klinik durumlarda konvansiyonel radyograflarla tanı konulamazsa 1-2 mm kesitlerle bilgisayarlı tomografi kullanılabilir.

Bu çalışmada intergluteal sulkusa direk travma sonrası gelişen nadir sakrum kırığının bilgisayarlı tomografi ile tanısı ve konservatif tedavisi sunulmaktadır.

**Anahtar Kelimeler:** Sakrum kırığı, direkt travma, tanı, tedavi

**Kanıt Düzeyi:** Olgu sunumu, Düzey V

## INTRODUCTION:

Sacral fractures after direct trauma are rare. Sacral fractures are observed with pelvic fractures in 40–50% of cases, and are most commonly seen after high-energy trauma<sup>1,5,6</sup>. Additionally, diagnosis of these fractures is difficult using conventional radiology techniques, due to the superposition of bowel gas in front of the sacrum<sup>8,14</sup>.

In this case study, a rare sacral fracture that was diagnosed with computerized tomography and treated with conservative treatment, and occurred after direct trauma to the intergluteal sulcus, is presented.

## CASE PRESENTATION:

A 20-year old male patient presented at the emergency room with coccygeal pain after a fall. X-rays were normal, and so he was treated with analgesics. The patient was not referred to the orthopedic clinic. After three days, the patient came to the orthopedic clinic with ongoing pain. The patient history revealed that he had fallen from a sledge while sledging on snow, been dragged downhill, and hit his sacrum on a stone. As this injury resembled the part of a credit card machine through which the card is swiped, we named it a “card swipe” fracture.

A physical examination of the patient revealed ecchymosis in the sacral region, edema, superficial lacerations and severe pain on palpation. A rectal examination did not reveal any bleeding or lacerations. The bulbo-cavernosus reflex and the perianal sensation were normal. A neurovascular examination was normal and there were no additional pathologies in other system examinations (Figure-1).

Lateral X-rays of the patient showed a transverse fracture line in the fourth sacral vertebra (Figure-2).

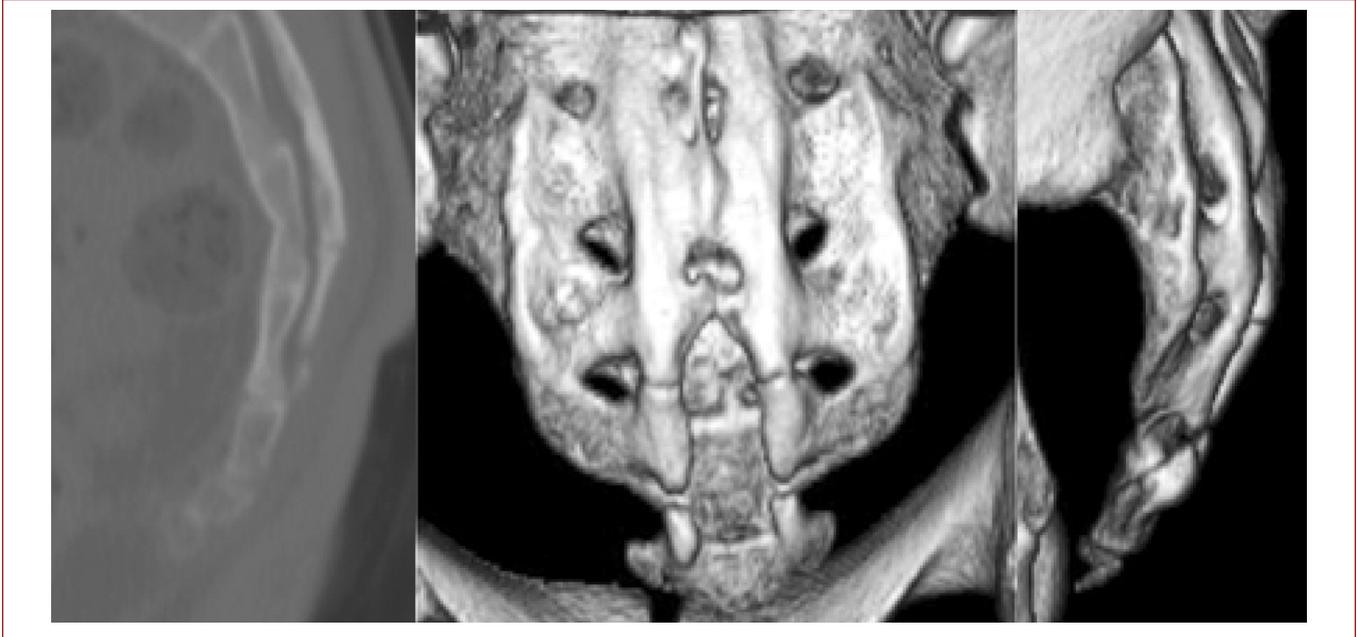
CT of the patient showed the transverse fracture of the 4<sup>th</sup> sacral vertebrae (Figure-3). Patient was treated with analgesic/anti-inflammatory medicine together with topical epithelization treatment for the superficial lacerations in the sacral region. Patient was given 4 weeks of bed rest, limitation of activity and analgesic treatment and followed up.



**Figure-1.** Clinical view of the patient.



**Figure-2.** Suspicious fracture at the S4 vertebra.



**Figure-3.** CT images of the sacral fracture.

We considered the fracture to be stable and so orthosis was not applied. A follow-up appointment four weeks after the incident showed complete regression of the clinical complaints.

#### **DISCUSSION:**

Denis et al. grouped sacral fractures into three zones, according to their anatomical location and neurological damage risk. Zone I includes the alar region, Zone II the sacral foramina, and Zone III sacral wing fractures<sup>3</sup>. Roy-Camille then grouped Zone III fractures into four groups<sup>9</sup>. This classification was later modified by Strange-Vognsen and Lebech. Type 1 are fractures that are angled but not translated, Type 2 are angled and translated, Type 3 are fractures that are translated to the cephalic or caudal direction, and Type 4 are segmental complex fractures resulting from axial impaction<sup>11</sup>. In this study, the fracture was Zone III. As it was angled but not translated, it fits the Roy-Camille Type 1 subgroup.

Sacral fractures generally occur after high-energy trauma, such as falling from a height or traffic accidents, by indirect mechanisms<sup>3,5,6</sup>. The case presented here occurred after a direct trauma to the intergluteal sulcus. This type of injury, that we termed a card swipe fracture, has never before been defined in the literature.

It is hard to evaluate sacral fractures by conventional radiological methods, due to gas superposition and the position of the bladder, which causes angling of the sacrum<sup>10,14</sup>. Pelvic inlet or outlet X-rays or Ferguson X-rays can be used to evaluate the sacrum<sup>4,13</sup>. In direct X-rays, it must be remembered that 35% of sacral fractures may be overlooked<sup>7</sup>. In suspicious clinical situations, if a diagnosis cannot be made through conventional radiographs, computerized tomography with 1–2 mm thick slices can be used<sup>12</sup>. In this case, a diagnosis was made by conventional X-ray. Further diagnostics were made to detect possible accompanying pathologies, which were able to confirm the initial diagnosis.

Because sacral fractures generally happen after high-energy trauma, head trauma and internal organ trauma are frequently observed<sup>2</sup>. In this case, an isolated sacral fracture was detected, as the relatively high-energy trauma had a localized effect and the intensity of the trauma did not cause any additional wounds.

Isolated sacral fractures can be easily overlooked, and this must be taken into account when considering any case in the emergency room with a possible sacral trauma. A conventional X-ray may not detect the fracture, so in cases where a sacral fracture is suspected, computerized tomography must be used.

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