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## Perineal compression in patients undergoing internal fixation of femur fractures: A cause for erectile dysfunction

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### Abstract

**Introduction:** Pudendal nerve trauma is a rare complication of orthopedic surgery, which usually occurs after traction of the pelvis on an orthopedic table fitted with a pelvic support. This trauma is thought to be due to crushing of the nerve against the perineal post or stretching of the Pudendal nerve due to excessive traction during fixation of fractures of femur. Usually it resolves spontaneously or can even persist. The prognosis depends on the severity of the symptoms.

**Materials and Methods:** This was a prospective study conducted between 30 participants. Patients who had femur fractures operated in fracture table were included in this study. Patients who had no h/o erectile dysfunction, sexually active male were the inclusion criteria. All patients were assessed for erectile dysfunction following surgery and followed up till recovery.

**Results:** 4 Patient gave history of occasional erection of penis – 3 to 4 times before full recovery, which was not suitable for penetration. Patients also gave history of no morning erections. All Patient had no history of erectile dysfunction before surgery. 8 Patient underwent office sildenafil test- tab. sildenafil 50mg stat in quiet comfortable room and observed for erection. One dose of 50 mg of Phosphodiesterase inhibitors was used whenever necessary and showed satisfying results in all patients.

**Conclusion:** Duration of surgery was also a contributing factor for recovery. Based on the above data, in longer duration of surgery the recovery was late. In surgically management femoral fractures, prolonged traction may be the causative factor in erectile dysfunction. Certain Strategies should be carried out to avoid perineal compression such as, distributing traction on the perineum by using a wide perineal post which is well padded, to reduce muscle tone and shorter surgery duration.

**Keywords:** Pudendal nerve, perineal compression, fracture table, erectile dysfunction

### Introduction

Femoral IM nailing as first introduced by Kuntscher in 1940, is reliable and predictable method of fixation [1]. Unfortunately, several complications have been documented, including non-union, mal-union, infection, limb length discrepancies, restricted range of movements [2, 3]. In addition to above mentioned complications several case reports have been reported Pudendal nerve palsy following femoral IMIL nailing [4]. Pudendal nerve trauma is a rare complication of orthopedic surgery, which usually occurs after traction of the pelvis on an orthopedic table fitted with a pelvic support [5]. This trauma is thought to be due to crushing of the nerve against the central part of the table or stretching of the Pudendal nerve due to excessive traction during fixation of fractures of femur [6]. Usually it resolves spontaneously or can even persist. The prognosis depends on the severity of the symptoms. In serious lesion. electrophysiological studies are done which identifies the level of neurological lesion.

### Materials and Methods

This was a prospective study conducted between the period of August 2020-September 2021 among 30 Participants. The data was collected over a period of 1 year with 15 patients diagnosed with proximal femur fractures, neck of femur fractures, AVN, shaft of femur fractures. Same surgeon performed all surgeries using same operative technique using same design fracture table. Inclusion criteria includes All sexually active male, patients fit for

surgery. Patients with proximal femur fractures operated in fracture table, patients who had no h/o erectile dysfunction, sexually active male. Exclusion criteria includes patients with previous h/o erectile dysfunction. The series comprised 30 male patients with a mean age of 44 years (23 to 60); Surgery of other bone fractures which required surgery was an average of 8 patients. The nature of injuries in 50% of the patients were road accidents, contact sports in 2(15%), fall in 4 (25%), assault in 2 (2%) and work place injuries in three (8%). Compound fractures were excluded from the study. 8 days was an average of delay in surgery from the date of injury to surgery. The fractures were classified by the OA/OTA system.

All the patients were initially stabilized with splints, ice packs application and limb elevation. All the cases were treated by direct definitive management, staged procedures were not included in the study. Appropriate AP and lateral radiographs were taken. The information acquired from each patient was their age, level of femur involved, type of fracture, gender, mechanism of injury, pre-operative traction, duration of surgery, pre-operative limb shortening, the duration of traction intra-operatively, use of a muscle relaxant and whether the fracture site opened to assist the surgery. The level at which the fracture occurred among 30 patients, 12 patients had mid-shaft femur fracture, 15 proximal and 3 distal part of femur fracture. Of the 15 patients with erectile dysfunction, 5 had mid-shaft fractures, and 6 had proximal fractures and 4 had distal fractures. There was no significant relation found between erectile dysfunction and age, pre-operative limb length discrepancies, delay to surgery, site of fracture. Also, no significance was found between Pudendal nerve palsy and the use of muscle relaxant intra-operatively in our study.

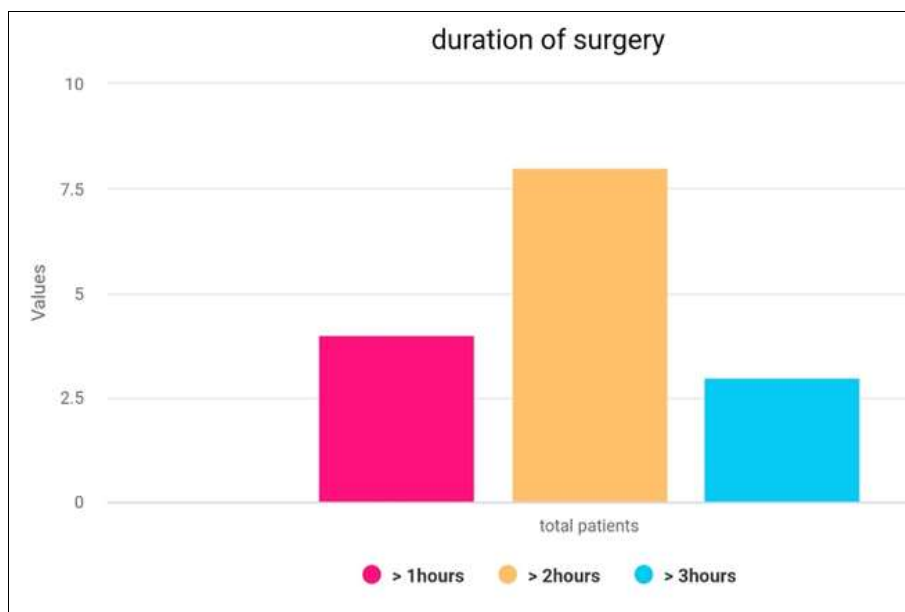
All patient was positioned supine on the fracture table and a well padded wide perineal post was placed between the genitalia and the limbs. The diameter of the perineal post was 3.8cm and it was padded with soft roll up to 8cm thickness. The injured limb was positioned in a traction boot which was

attached to the mobile traction unit. The unaffected limb was attached to a post in abduction, flexion, and external rotation position. Under spinal anesthesia patient is made to lie supine on fracture table and under aseptic precautions parts painted and draped. An incision made from tip of Greater trochanter extending 6cms distally. Entry created via pyriformis fossa using bone awl and guide wire passed. Under c-arm guidance fracture reduced (close) and fixed using proximal femoral nail in case of proximal fractures, ILIM nail in case of shaft and distal fractures. Wound closed in layers, sterile dressing applied and patient shifted from the fracture table.

Post-operatively patient complained of erectile dysfunction on an average of POD 15, which lasted more than 3 months. Patient gave history of occasional erection of penis – 3 to 4 times in 3 months which was not suitable for penetration. Patient also gave history of no morning erections. Patient had no history of erectile dysfunction before surgery. Post-operative examination of Penile shaft, urethral meatus, b/l testis was done 8 patients underwent office sildenafil test- tab. sildenafil 50mg stat in quiet comfortable room and observe for erection. Phosphodiesterase inhibitors (50 mg) was given as a single dose when needed and was effective in all patients with erectile dysfunction. All patients were assessed for erectile dysfunction following surgery. They were followed up till their recovery. The results were examined for statistical significance with SPSS 11. A p-value of <0.05% was considered to be statistically significant.

**Results**

Total of 30 patients were included in this study. Out of which 15 patients developed erectile dysfunction (50%). 4 Patient gave history of occasional erection of penis – 3 to 4 times before full recovery, which was not suitable for penetration. Patients also gave history of no morning erections. All Patient had no history of erectile dysfunction before surgery. 8 Patient underwent office sildenafil test- tab. sildenafil 50mg stat in quiet comfortable room and observed for erection. The average duration of surgery was 2hours (Fig 1).



**Fig 1:** Association between duration of surgery and erectile dysfunction

The duration of surgery was the major contributing factor in development of erectile dysfunction. Based on the above data, in longer duration of surgery the recovery was late. There was no statistical significance between erectile dysfunction and

thickness of the post, use of muscle relaxants. 4 Patients gave history of occasional erection of penis – 3 to 4 times before full recovery, which was not suitable for penetration. Patients also gave history of no morning erections. All Patient had no

history of erectile dysfunction before surgery. 8 Patient underwent office sildenafil test- tab. sildenafil 50mg stat in quiet comfortable room and observed for erection.

Phosphodiesterase inhibitors (50 mg) as a single dose was used whenever needed, was effective in all patients. The average time of recovery was from 3 to 9 months (Fig 2).

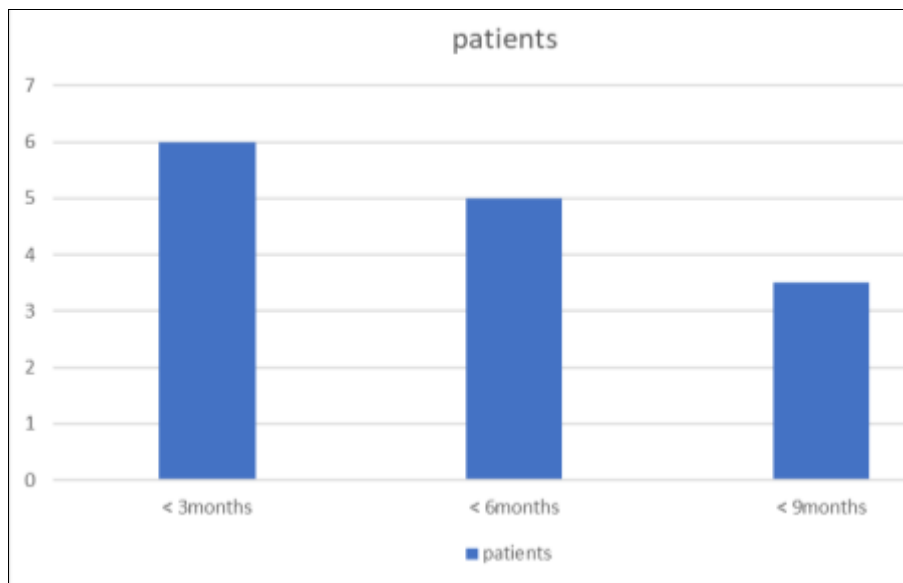


Fig 2: Recovery duration

6 patients recovered on an average of < 3months, 5 patients recovered on an average of < 6months, 4 patients recovered on an average of < 9months (Table 1).

**Discussion**

Above mentioned case implies that prolonged traction used in femoral fractures surgery may be the causative factor in erectile dysfunction. Out of 30 patients 15(50%) developed erectile dysfunction. The average duration of surgery was more than 2 hours 10 minutes. It has been analyzed that the actual traction pressure on a fracture table, exerted on the perineal region, to be greater than 1.4kg/cm<sup>2</sup> [7, 8]. Thus, increasing the risk of perineal nerves involved in erectile mechanism at a greater risk of injury as well as other injuries like urethral tears. In our study, there were no relations was found between erectile dysfunction and age, pre-operative limb length discrepancies, delay to surgery, site of fracture.

Many authors have observed association between the size of the perineal post and development of pudendal nerve palsy. The smaller post leads to deeper penetration of the post into the pelvis, thereby compressing the pudendal nerve [9, 10]. In the study by France *et al*, the final diameter of the post was

9cm. The diameter of the post was 4.1cm and was increased to a total diameter of 6.8cm n the study by Brumback *et al* [11]. Kao *et al* found a higher incidence of palsies with posts which measured 3.5cm in diameter versus those which measured 5cm [12]. In our study, the diameter of the post was 3.8cm and its diameter was increased to 8cm. In contradiction, our study had no significant relation between perineal post diameter and Pudendal nerve injury

Mallet *et al*. reported that there was a significant reduction in the incidence of postoperative ED with the usage of intraoperative doses of muscle relaxants [13]. Adequate dose of muscle relaxants acts by reducing the muscular forces acting on the fracture fragments, helps in achieving fracture reduction so that lesser amount of traction needed during reduction maneuvers. In contrast in our study there were no significant correlation between muscle relaxation and erectile dysfunction. Post-traumatic stress disorder is common after high energy trauma and may play a role in post-traumatic erectile dysfunction. Therefore, psychological treatment also should be a part of management in order to achieve good outcomes. [14, 15]

Table 1: Patient Demographics and Data

| S.no | Age/sex | Side | Diagnosis               | Procedure         | Duration | Compli-Cation | Recovery Time |
|------|---------|------|-------------------------|-------------------|----------|---------------|---------------|
| 1    | 25/M    | L    | IT fracture             | PFN A2            | 2h 20min | Yes           | 3months       |
| 2    | 36/M    | R    | IT fracture             | PFN A2            | 2h       | Nil           | -             |
| 3    | 44/M    | R    | IT fracture             | PFN A2            | 1h 30min | Nil           | -             |
| 4    | 54/M    | L    | AVN                     | CC screw fixation | 2h 30min | Yes           | 6months       |
| 5    | 28/M    | L    | IT fracture             | PFN A2            | 1h 40min | Yes           | 5months       |
| 6    | 32/M    | R    | Shaft of femur fracture | IMIL nailing      | 3h       | Yes           | 7months       |
| 7    | 38/M    | R    | IT fracture             | PFN A2            | 2h       | Nil           | -             |
| 8    | 37/M    | R    | Shaft of femur fracture | IMIL nailing      | 2h       | Yes           | 6months       |
| 9    | 29/M    | L    | IT fracture             | PFN A2            | 1h 50min | Yes           | 3months       |
| 10   | 31/M    | R    | AVN                     | CC screw fixation | 2h       | Nil           | -             |
| 11   | 23/M    | L    | Shaft of femur fracture | IMIL nailing      |          | Nil           | -             |
| 12   | 46/M    | R    | Distal femur fracture   | IMIL nailing      | 2h 40min | Yes           | 3months       |
| 13   | 51/M    | R    | Shaft of femur fracture | IMIL nailing      | 3h       | Yes           | 9months       |
| 14   | 40/M    | L    | Shaft of femur fracture | IMIL nailing      | 2h       | Nil           | -             |
| 15   | 49/M    | L    | IT fracture             | PFN A2            | 2h 15min | Yes           | 7months       |

|    |      |   |                         |              |           |     |          |
|----|------|---|-------------------------|--------------|-----------|-----|----------|
| 16 | 27/M | L | Shaft of femur fracture | IMIL nailing | 1h 40min  | Nil | -        |
| 17 | 39/M | R | IT fracture             | PFN A2       | 1h 30min  | Nil | -        |
| 18 | 33/M | R | Shaft of femur fracture | IMIL nailing | 1h 40min  | Yes | 5months  |
| 19 | 26/M | R | Distal femur fracture   | IMIL nailing | 1h 45min  | Nil | -        |
| 20 | 37/M | L | Shaft of femur fracture | IMIL nailing | 2h 45min  | Yes | 3months  |
| 21 | 49/M | R | Shaft of femur fracture | IMIL nailing | 1h 50min  | Nil | -        |
| 22 | 49/M | L | IT fracture             | PFN A2       | 3h 10min  | Yes | 8months  |
| 23 | 24/M | R | Shaft of femur fracture | IMIL nailing | 2h 30min  | Yes | 3 months |
| 24 | 23/M | L | Shaft of femur fracture | IMIL nailing | 2h 25min  | Yes | 4months  |
| 25 | 49/M | R | IT fracture             | PFN A2       | 1h 20min  | Nil | -        |
| 26 | 42/M | R | Shaft of femur fracture | IMIL nailing | 1h 30 min | Nil | -        |
| 27 | 60/M | L | IT fracture             | PFN A2       | 1h 25min  | Nil | -        |
| 28 | 25/M | R | Shaft of femur fracture | IMIL nailing | 1h 35min  | Nil | -        |
| 29 | 29/M | L | Shaft of femur fracture | IMIL nailing | 1h 30min  | Nil | -        |
| 30 | 38/M | R | Distal femur fracture   | IMIL nailing | 2h 20min  | Yes | 3 months |

R-Right, L-Left, H-Hour

### Conclusion

Duration of surgery was also a contributing factor for recovery. Based on the above data, in longer duration of surgery the recovery was late. In surgically management femoral fractures, prolonged traction may be the causative factor in erectile dysfunction. Certain Strategies should be carried out to avoid perineal compression such as distributing traction on the perineum by using a wide perineal post which is well padded, to reduce muscle tone and shorter surgery duration.

### Conflict of Interest

Not available

### Financial Support

Not available

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