

Bilateral multiligament injury of knee caused by entangled dupatta

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ABSTRACT

We report a rare case of bilateral multiligament knee injury in an 18-year-old female employed in garment industry. Patient was wearing salwar kameez and dupatta while operating an electric laundry machine. In this case we discuss a peculiar mechanism of injury caused due to wearing dupatta near working site and suggest simple preventive measures.

Key words: Multiligament injury, mechanism of injury, dupatta

INTRODUCTION

Salwar kameez and dupatta is a traditional dress worn in India and subcontinent by females. Entanglement of loose hanging garment like dupatta and saree are responsible for accidental injury while travelling and at workplace.¹⁻⁵ In this case dupatta got caught in rotating parts of electrically powered laundry machine pulling the patient leading to hyperextension injury at both knees resulting in bilateral multiligament injury with mandible fracture.

Multiligament injury of the knee is rare.⁶ This condition arises as a result of high and low energy trauma leading to knee dislocation, which often spontaneously reduces but predisposes the limb to neurovascular injury.⁷ Bilateral multiligament injury due to dupatta has not been reported in literature till date. Management of multiligament injury of knee is controversial.^{8,9} Hirschman *et al.*,⁹ has suggested standardized surgical and postoperative protocol for management of multiligament knee injury.

This report highlights the unique mechanism of injury and simple preventive measures at the working site to avoid such accidents.

CASE REPORT

An 18-year-old female met with an accident while working on electric laundry machine. Patient was wearing a salwar kameez, with a dupatta hanging loosely around the neck with the two arms of dupatta in the front. While working on the electrically powered laundry machine, the dupatta got caught in the rotating parts of the machine pulling the head towards it causing sudden hyperflexion of spine with anterior movement of pelvis and the femur, the foot remained static with knee abutting against the edge of metal panel causing hyperextension at the knee [Figure 1]. This may have caused bilateral knee dislocation which could have reduced spontaneously resulting in multiligament injury.

Patient was referred to us after 3 weeks. As per the notes of the private hospital, patient had presented with bleeding through nose and breathlessness with bilateral knee joint swelling and foot drop. There she was intubated for 4 days and bilateral above knee slab applied. She was operated for mandibular fracture with plating 1 week after the accident after which she was referred to us. Plain radiographs, CT scan, and MRI of both knees revealed right knee - schatzker type 4 tibia condyle fracture, lateral collateral ligament (LCL) avulsion fracture from the fibular head and anterior cruciate ligament (ACL) rupture (KD type V) [Figures 2a and b]. The patient was operated on the right knee tibia condyle fracture. Open reduction with intraarticular reduction and buttress plating was done [Figure 2c]. The LCL avulsion fracture was found to be united. While the left knee showed LCL avulsion fracture and posterior cruciate ligament (PCL) rupture (KD type III) [Figures 3a and b]. EMG-NCV showed

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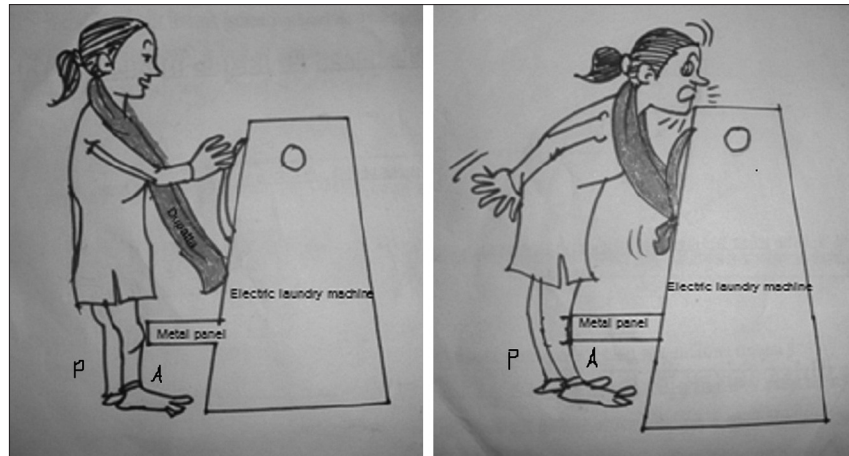


Figure 1: A line diagram showing the mechanism of injury (A – Anterior, P – Posterior)

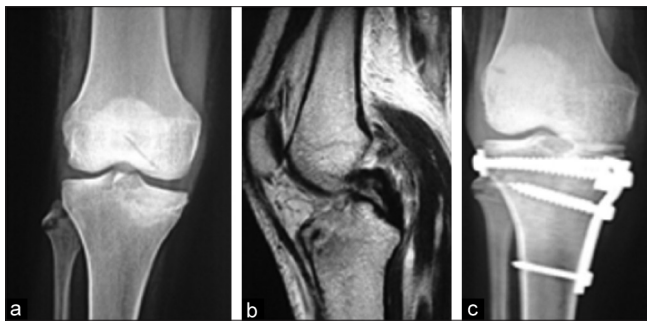


Figure 2: (a) Plain radiographs of right knee anteroposterior (AP) view, showing undisplaced lateral collateral ligament avulsion, type 4 schatzker tibia condyle fracture (b) MRI of right knee showing posterior cruciate ligament rupture (c) Postoperative plain radiographs of right knee (anteroposterior view), with buttress plating done

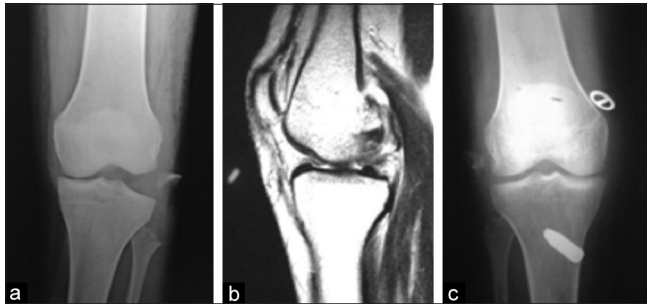


Figure 3: (a) Plain radiographs of left knee (anteroposterior view), showing lateral collateral ligament avulsion (b) MRI of left knee showing anterior cruciate ligament rupture (c) Postoperative plain radiographs of left knee (anteroposterior view), showing posterior cruciate ligament reconstruction done

common peroneal nerve involvement. In the subsequent week left knee PCL reconstruction with hamstring tendon grafting was done [Figure 3c]. Due to patient refusal, left knee posterior lateral corner (PLC) reconstruction and right knee ACL which was planned in the subsequent week could not be done. The patient has been followed for 18 months, on clinical examination, right knee IKDC score was 60.9, Lysholm score was 64, the left knee IKDC score was 69 and Lysholm score was 69.

DISCUSSION

Injuries and accidents due to loose hanging garments have been described in literature. However, bilateral multi ligament injury has not been reported yet. The literature describes similar pattern of injuries due to dupatta depending upon the site it is worn varying from scalp avulsion to cervical spine injuries.¹⁻⁵ Irrespective of the mechanism of injuries and types of injuries the cause remains the same (loose dangling garments getting entangled in the machine). These injuries can be prevented by simple measures.

In 1929, Isadora Duncan, a world-famous dancer, died due to long scarf getting trapped in the wheels of her Bugatti car. This later was termed as ‘long scarf syndrome’ Isadora Duncan Syndrome’.¹⁰ Jain *et al.* described a case series of 12 cervical spine injuries due to dupatta with poor prognosis.¹ Ahmad *et al.* had described two cases of scalp avulsion due to long scarf in working females.⁵

The treatment of multiligament injury is controversial. Systematic review of the studies till now has been able to conclude that operative treatment, early (within 3 weeks) and staged intervention, repair of large avulsion fractures of ligaments and reconstruction of ACL, PCL and PLC followed by postoperative rehabilitation gives better Lysholm and IKDC scores.^{6-8,11-14}

Hirschmann *et al.*,⁹ advocates early single stage complete reconstruction of both cruciate ligaments and all peripheral structures with arthrotomy and open surgery as recommended treatment protocol in acute cases. Eighty-two percent of their patients ($n=56$) returned to previous work.

In this particular case we would like to highlight the peculiar mechanism of injury, due to dupatta. From 2007 to 2009,

Table 1: Dupatta injuries

Direct pattern	Indirect pattern
Cervical spine injuries	Degloving
Laryngeal ruptures	Crush injuries of the extremities
Carotid artery injuries	Knee dislocation and multiligament injury
Superficial abrasion, cuts	Mandible fracture
Scalp avulsion	Burns
Strangulation and death	

we received four other cases in the casualty, all resulted due to loose garments like saree or dupatta getting entangled in vehicular wheel, leading to two cases of cervical spine injuries, one of scalp avulsion, one of degloving compound injury of the lower limb. Out of the two cervical spine patients, one had C5-6 dislocation who died 4 days after injury and other had C6-7 flexion distraction injury which remained quadriparetic even after decompression and fixation. The patient with scalp avulsion had undergone resuturing of scalp with good results, and the patient with circumferential degloving soft tissue injury had to undergo delayed above knee amputation. Reviewing earlier articles^{1-5,10} we would like to stress on these types of injuries, and term these wide range of injuries as “Dupatta Injuries”, caused by loose body garments like saree, dupatta and divide it into direct and indirect pattern. Direct pattern are those caused at the site where the cloth is worn, while indirect are those caused at the site away from where it is worn [Table 1].

We find these injuries easily preventable by removal of loose hanging garments at work place or by wearing apron and by educating masses about the risk of loose garments near moving machines, vehicles and fire site.

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