



# Kite String or Manja Cut Injury: A New Culprit

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## Abstract

**Background** Kite string injuries (manja cut injuries), particularly those caused by Chinese manja, are new culprit of emergencies especially in the month of January in Maharashtra region. These injuries commonly affect the neck, face, hands, and legs, especially among individuals traveling on two wheelers. The visibility challenge, where the kite's thread is difficult to see, further exacerbates the risk.

**Methods** We have studied 10 cases of manja cut injuries presented to a tertiary care center in Nagpur during the last 2 years.

**Result** A total of 10 patients reported kite string-related injuries to our department over a period of 2 years. All patients were male. The majority of patients presented in the younger age group with the mean age of presentation was 25 years. Majority of the patients had injuries in zone 2 of the hand.

**Conclusion** Kite flying is a traditional festival celebrated in the month of January in Gujarat and Maharashtra for years. However, the introduction of Chinese or nylon manja has led to serious injuries and fate, affecting not only kite flyers but also bystanders, animals, and birds. This study seeks to highlight the harmful consequences of Chinese manja and deceptive appearance of manja giving false impression of simple lacerated wound which could be just a tip of the iceberg.

## Keywords

- ▶ kite string
- ▶ Chinese manja
- ▶ hand injuries

## Introduction

Kite flying, a tradition dating back over three thousand years to its origins in India, has evolved into a leisure activity enjoyed worldwide. However, in some regions of India, Pakistan, and Afghanistan, it takes on a more competitive nature, resembling a battle where participants vie to bring down each other's kites using specialized strings called "Chinese manja."<sup>1</sup> Coated with powdered glass or chemicals to enhance cutting ability, these strings pose a significant risk, often causing a range of injuries from minor cuts to severe wounds, and tragically, even fatalities. The fine, nearly invisible nature of "manja" exacerbates the danger, with

unsuspecting bystanders and participants alike falling victim to its lethal potential.<sup>2</sup>

Electrocution injuries caused by the strings attached to kites due to fall on electric pole, particularly in children, have also been reported. The distribution of kite-related injuries varies across different locations and regions, influenced by local cultures and traditions. For instance, there is an epidemic of kite-related injuries during the festival of Makar Sankranti in the states of Maharashtra, Gujarat, and Rajasthan in January, or during the Basant festival in North India and Pakistan. While some articles discuss the spectrum of kite-related injuries, literature exclusively focusing on hand injuries related to the kite string or "manja" is rarely found.<sup>3,4</sup>

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## Aims and Objectives

The primary objective of this article was to underscore a distinctive and infrequent, yet noteworthy, injury mechanism. Although the resulting pathology and treatment options are relatively common in everyday practice, the etiology warrants special attention due to the potential for the injury to go unnoticed by an unsuspecting observer. The aim of this article was to describe how extreme thinness and light color of manja reduce its visibility in day light, usually free flying kite string also called as “kati patang” causes maximum damage when other kite flyers catch it or it get entangles around the face, neck, or foot of bike or bicycle riders.

## Materials and Methods

We present a prospective study over a period of 2 years from January 2022 to December 2024 dealing with exclusive manja cut injury that presented to the department of plastic, reconstructive, and maxillofacial surgery at our institute. The

study was conducted over a period of 2 years. The patients with direct kite string injuries (injuries caused during catching of manja thread or entanglement of thread around body parts of bypasses) were admitted in the plastic surgery ward and patients with indirect kite string injuries (electrocution injuries due to fall on electric pole while catching the kite string or polytrauma due to fall from terrace) were admitted in the burn ward under the department of plastic surgery. Patient profile, mode of injury, and part of body involved were noted. Clinical and radiological examination of injuries were done. All patients were divided into two categories, group 1 were injured during kite flying who were involved in kite flying and group 2 were bypassers who were not involved in kite flying. Each wound was explored in the emergency operation theater and definitive management was done.

## Results

A total of 10 patients reported kite string-related injuries to our department over a period of 2 years. All patients were



**Fig. 1** Preoperative, intraoperative, and postoperative pictures of the right hand middle finger and ring finger flexor tendon injury.

male. The majority of patients presented in the younger age group with the mean age of presentation 25 years.

Majority of patients (6) fall into the group 1 category. Majority of the patients (7) presented acutely to the emergency department while few (3) patients thinking the injury to be trivial because of deceptive appearance of the wound had delayed presentation. Two patients who presented late had tendon injuries.

Six patients presented with injuries to the right hand while one presented with injuries to the left hand, one with injury to the foot, one on the face, and one indirect injury due to electrocution.

Majority of the patients had injuries in zone 2 of the hand. Majority of injuries in zone 2 of flexor tendon hand injuries were sustained while catching the cut kite string. In one case, revascularization of the middle and ring finger was done as both digital neurovascular pedicle were cut (►Figs. 1 and 2).

Injuries to the zone 5 flexor tendon and injuries to extensor tendons were sustained by bike riders who were trying to protect their face from free-flying cut manja thread “kati patang.” Total number of digits injured were 8 and the total number of tendons injured were 14. Five patients had digital neurovascular pedicle injury. Flexor digitorum superficialis, flexor digitorum profundus (FDP), and flexor carpi radialis tendons were repaired with 2-strands modified Kessler technique using Prolene 3-0 RC suture and epitendinous with Prolene 6-0 suture. Extensor tendon was repaired by continuous suture using Prolene 4-0 suture. Neurovascular pedicle was repaired using Ethilon 9-0 RB microtip suture.

Two patients presented with lacerated wound over the neck because of entanglement of manja string around the neck while riding bike. After ruling out tracheal injury, closure in layers with Vicryl 5-0 and Prolene 6-0 sutures was done for better aesthetic outcome.



**Fig. 2** Preoperative, intraoperative, and postoperative pictures of the right hand index finger flexor tendon injury showing repaired flexor tendon and neurovascular pedicle.



**Fig. 3** Preoperative, intraoperative, and postoperative pictures of right sided tendo Achilles injury.

Tendo Achilles tendon injury due to Chinese manja entangled around the ankle while riding bike was repaired by Polydioxanone 1-0 suture with core suture by modified Krackow technique and epitendinous suture using Prolene 4-0 suture (►**Fig. 3**).

Staged reconstruction of flexor tendon was planned in case of old zone 2 flexor tendon injury. In stage 1, silicon rod by Hunter's technique was inserted for the formation of pseudosynovial sheath (►**Fig. 4**). In the second stage, the patient will require FDP reconstruction using palmaris longus tendon graft.

Patient with electrocution injury (indirect kite string injury) due to fall on high-voltage electric pole while catching kite string presented with dry gangrene of the right lower limb and eschar over the right axillary region and left lower limb and underwent above knee amputation of the right lower limb and debridement of wounds.

Patient presented late with scar over the left malar region was advised regarding multimodal approach for scar management (►**Table 1**).

### Discussion

Kite flying is a popular leisure activity worldwide, with certain regions like Maharashtra, Gujarat, and Rajasthan in India celebrating kiting festivals such as Makar Sankranti in January, while places like North India and Peshawar in Pakistan mark the arrival of spring with Basant. Injuries related to kite flying can be indirectly associated, such as falls from height leading to head injuries or fractures and electrocution injuries. According to a study conducted by Mehmood et al in Peshawar in 2009, out of 139 patients admitted with kite-related injuries, simple lacerations and cuts to fingers were the most common presentation (29%), followed



**Fig. 4** Preoperative, intraoperative, and postoperative pictures of old zone 2 flexor tendon injury showing stage 1 reconstruction of flexor tendon using silicon rod.

by bruises (21%), with neck injuries observed in 15 (11%) patients. The study also noted that the majority of injuries (63%) occurred in the age group of 10 to 29 years, with a male-to-female ratio of 9:1.5.<sup>5</sup>

Injuries caused by kite strings Mainie's nylon (Chinese) manja, often sharpened with ground glass, can pose serious threats. Loose threads may entangle the neck of a high-speed motorist, resulting in severe cut throat-like injuries. Singh et al reported a significant maxillofacial laceration in a child seated in front of a motorcycle when struck by a stray kite string.<sup>6</sup> In regions like Brazil where kite flying is popular, Ventura et al documented 13 patients with cervical injuries in their study, with zone II and zone III neck injuries being predominant.<sup>7</sup> Additionally, a case report by Babu et al highlighted a zone II cervical region injury to a motorcyclist, with injury to the external jugular vein being the most commonly reported.<sup>8</sup>

The study by Gupta et al highlights the diverse cases of kite string injuries during the Makar Sankranti festival in Gujarat, India.<sup>9</sup> Despite often being underestimated, kite string injuries have proven fatal in many instances.<sup>10</sup> Kite flying and "kite wars" are popular activities, especially among adolescents and young adults, with the average age of patients in the study being approximately 19.90 years.

Reddy et al reported index case of kite string causing injuries to posterior and lateral compartment of ankle.<sup>11</sup> In our series, we operated one case of tendo Achilles injury due to entanglement of manja thread around the ankle while riding bike.

Dhull et al reported a case of digital subtotal amputation due to kite string injury.<sup>12</sup> In our series, we did one case of revascularization of right hand middle finger and ring finger with both digital neurovascular pedicle injury.

**Table 1** Spectrum of presentation

Case no.	Age (in years) and sex	Presentation	Part and zone of body involved	No. of digits injured	No. of tendons injured	No of nerves and vessels injured	Management
1	28 M	Acute	Right hand index finger zone 2	1	2 (1 FDS and 1 FDP)	Radial digital neurovascular pedicle	Tenorrhaphy and neurovascular pedicle repair
2	12 M	Acute	Left hand little finger zone 2 flexor injury and lacerated wound over neck	1		Ulnar digital neurovascular pedicle	Primary nerve repair and suturing of lacerated wound over neck
3	8 M	Acute	Right hand middle and ring finger zone 2 flexor tendon injury (►Fig. 1)	2	4 (FDS and FDP)	Both digital neurovascular pedicle	Tenorrhaphy and neurovascular pedicle repair
4	26 M	Acute	Right hand index finger zone 2 flexor tendon injury (►Fig. 2)	1	2 (FDS and FDP)	Radial neurovascular pedicle	Tenorrhaphy and neurovascular pedicle repair
5.	53 M	Delayed	Right foot tendo Achilles rupture (►Fig. 3)		1 (tendo Achilles)		Tenorrhaphy
6	26	Delayed	Right hand zone 2 flexor tendon injury (►Fig. 4)	1	2 (FDS and FDP)		Staged reconstruction of flexor tendon
7	9 M	Acute	Electrocution injury to right lower limb, right axilla, and left lower limb				Above knee amputation of right lower limb
8	32 M	Delayed	Left malar region				Conservative management for scar
9	22 M	Acute	Right hand zone 5 injury and lacerated wound over neck		1 (FCR)		Tenorrhaphy and lacerated wound closure over neck
10	34 M	Acute	Right hand Index and middle finger zone 4 extensor tendon injury	2	2 (extensor tendon)		Tenorrhaphy

Abbreviations: FCR, flexor carpi radialis; FDP, flexor digitorum profundus; FDS, flexor digitorum superficialis; M, male.

Crafting laws to facilitate safe kite flying, while considering public sentiment and enthusiasm, is a prudent approach. Therefore, regulation and education, rather than outright prohibition, are recommended. Depending on the geographical region, kite flying activity may surge during specific events, months, or times of the year. Since these periods are predictable, prevention efforts can be targeted rather than resorting to bans. Additionally, avoiding or restricting kite flying from rooftops and designating open spaces specifically for kite flying can enhance safety. These designated areas should be situated away from roads, power lines, airports, bird sanctuaries, and other potential hazards. Furthermore, ensuring the availability of medical facilities for immediate care and transportation during such events is essential for prompt treatment and response to any injuries.

## Conclusion

Emphasizing safety measures, involvement of local government bodies, allocation of specific zones, and ensuring parental or guardian supervision can help prevent numerous avoidable injuries, ensuring the sport remains both enjoyable and safe.

### Patients' Consent

Patients' consent to participate in the study was taken.

### Funding

None.

### Conflict of Interest

None declared.

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