ORIGINAL ARTICLE

Fodder Cutter Amputations-Evaluation of Risk Factors

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ABSTRACT

Objective: To determine the spectrum of injuries with fodder cutter (toka) machines and which sex is more prone to these injuries in southern Punjab.

Methods: Total 73 patients were included in this interventional study. All the patients with toka machine injuries of either sex presenting in emergency department during fifteen months from Jan 2014 to March 2015 were included in the study.

Results: Male patients were 32 (44%), Female and children involvement in such injuries was 41(56%). Upper limb was involved in 69 patients and bilateral limbs in 04 patients.

Conclusion: Toka machine injuries are very common that leads to morbidity, disability and often mortality. Victims were usually females, male and children, so the awareness campaigns regarding hazards and safety measures in using agricultural machine should be launched at national level.

Key words: Toka machine injury, female and children, traumatic amputation upper limb.

INTRODUCTION

Traumatic fodder cutter amputations are very serious and drastic injuries. These injuries usually involve young productive age group [1]. If identified at a real statistics, such injuries may be considered leading reason for high morbidity and mortality [2]. Fodder cutter injuries are usually seen in the emergency trauma but exact data about its prevalence is not documented in developing countries like Pakistan [3]. Traumatic amputations of hand and wrist are common injuries in rural, agriculture related areas around the globe [4].

Chaff cutter and chopping chest are German names for devices once used by farmers to chop straw, hay and corn fodder into short pieces easily digested by livestock. Initially this machine was manually driven and resulting injuries rate was low. With the introduction of power- driven fodder cutting machines, not only the rate of wrist and hand amputations have increased but also death incidence have multiplied. There is trend to develop safer fodder cutting machines in the developed countries. These amputations result in a lot of social, cultural and monetary loss [5]. Most of the people working in every- day farming do not adopt recommended safety protocol either due to ignorance or awesome neglect. Patients of all age groups and genders are involved in these activities and the resulting morbidity is very high and alarming [6,7].

Internationally medical data about the incidence of agricultural injuries/amputations is sparse even in developed countries where 30-50% of the total population is related to farming [8]. Epidemiological studies are the need of time to project the grievousness of these injuries in agriculture workers [9]. Most of the workers suffer from injuries due to stress, lack of time and exhaustion leading to upper extremity involvement in majority of the patients [10].

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Patients of all categories are involved and children also suffer from fodder cutter amputations. This incident usually occurs when kids are kept alone in the homes and parents are busy in the farmyard. Children try to copy the actions of their elders and result in disastrous wrist and hand injuries [11]. Hence, it is immense need of time to conduct a study to highlight this important issue for the prevention of disability resulting from fodder cutter injuries and to prepare the public at large to adopt the safety protocol while working with fodder cutting machines.

METHODS:

A retrospective, descriptive, interventional study was conducted in orthopedic department for 15 months from January 2014 to March 2015. All the patients presenting with fodder cutter wrist and hand amputations/injuries was included in the study irrespective of age and sex. Patients presenting with injuries /amputations resulting from industrial tools other than farming and diabetic peripheral vascular amputations were excluded from the study.

All the patients were received in the emergency department and admitted. Resuscitation of all the patients was done with standard protocol. Wounds were immediately treated with compression dressing. Laboratory investigations like blood complete examination and blood grouping was sent. Radiological examinations of the involved and other needed parts were performed; Blood transfusion as required was done. Antibiotics were started on empirical basis and tetanus prophylaxis was carried out.

Improvement in general condition of patients was monitored clinically. All the patients were prepared for emergency surgery on priority basis. Preoperative and postoperative photographs was retrieved and recorded. Demographic data regarding age, sex, sidedness, level of injury, type of treatment given and type of fodder cutter machine used was documented.

Results:

In this study 73 patients affected by power-driven toka machine (fig-1) injury were received during this 15 months period. Out of these 32 were male and 41 were females.

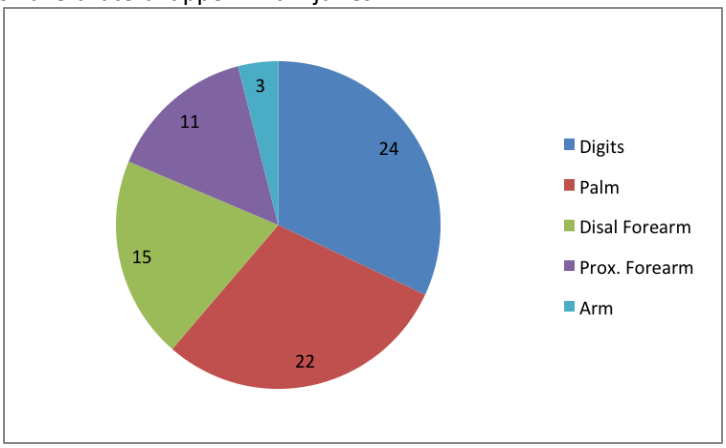
Fifty-six patients were below the age of 30 years and 17 patients were above 30 years.

Fig -1. Unprotected functioning of power- driven machine.

No patient affected by hand driven toka machine was received (Fig-2).

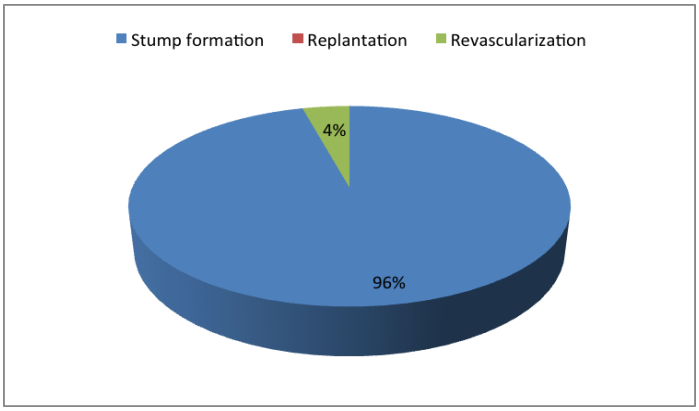
Fig-2. Showing old manual fodder cutter machine

All patients sustained injuries to the upper limbs. Left limb was involved in 28 (38%)patients and right upper limb was involved in 41 (56%) patients and 4(5%) patients have bilateral upper limb injuries.



According to site of injuries 24 (32%) patients having digits level injuries, 22(30%) patients having palm level injuries including wrist, 15 (20%)patients have distal forearm injuries, 11(15%) patients have proximal forearm injuries and 03 (4%)patients having injuries in the arm as shown in Graph-1.

Graph-1 Shows site of involvement in the patients. Stump formation was in 70 (96%) patients as crushing did not allow re-plantation and in 03(4%) patients revascularization was done which was successful showing in Graph 2. Graph 2 Shows treatment done in the patients. Presentation of important cases with their pictures



DISCUSSION:

The fodder chopper machine is one of the most common agricultural machines. Toka machine may be called as "SNAKE OF THE SLEEVE" OR DOUBLE SIDED SWORD. Hence it is mandatory to identify and study risk factors in agricultural accidents. The common root factors are inattention, complacency, rushing, or carelessness, which contribute to the decreased vigilance of the operator. Removal of safety shields and the use of machinery that does not conform to be manufacturer or safety-sigh standards is also a common contributing factor [12].

In 100% of the patients the upper extremity was affected in this study. In upper limb the sequence of patients sustaining injuries in order of maximum to minimum are to digits, mid carpal, at wrist, forearm and arm respectively. In agricultural related injuries, trauma to hand and upper extremity are extremely common, representing from 40% to 70% of total admissions that occur on a farm yard [13].

Traumatic amputation of the fingers and high-energy open fractures of the radius and ulna are among the most common upper extremity injuries caused by entanglement in farm machinery [14]. The main area of body involved in agricultural injuries was upper limb, in the study, which was conducted by Riffat Mahmood 2015 [2]. Among agricultural machine the present study documented that fodder cutter is the commonest cause of injuries.

In study about agricultural related upper limb trauma, injuries pattern are tractors trauma 10.2-54%, power take-off device (5.4%), grain augers (6.4% to 22%), balers and thrashers (3.9%), and harvest combines (8.6% to 16%) [15].

In another Turkeys study the author found that tractor was a most commonly involved in agricultural related accidents [16]. These injuries are different from other occupations in agricultural work people of all ages and gender in a family participate [17]. In present study 77% of the patients were observed affected by toka machine injuries are the female and children, the minimal age of the child involved was two years and four patients having bilateral upper limb injuries.

The agricultural injuries are highly gender specific with 90 to 97% of these injuries occurring in males [18]. But due to socioeconomic setup in this study only 44% of the injured patients are males as females and children are dedicated to perform duty about fodder cutting in the homes.

CONCLUSION:

On the basis of our evaluation the "solution is prevention". It can be achieved through proper education of the operated designing of the fodder cutter machine. In manufacturing machine priority will be safety and should be constructing to full fill the safety criteria as follows: disengage Gear, Conveyer belt, distance detector, emergency brake, increase rollers, flesh sensor, automatic switching, and retractable rollers.

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