

## Study and Management of fall from Walnut Tree Related Abdominal Trauma

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### Abstract

### Original Research Article

**Background:** About 70 to 80% of rural Kashmir is associated with farming and tree climbing is an important part of it. Approximately 10 to 15% are associated with walnut tree harvesting. The aim of this study is to determine and study the clinic-pathological profile of the abdominal injuries with walnut tree fall. **Material and methods:** A prospective study of two years was done in our tertiary care hospital presenting with fall from walnut tree and abdominal injuries associated with it. **Results:** A total of 60 patients had fall from walnut tree out of which maximum preponderance was in harvesting season including 48 cases and rest were in post harvesting.

**Keywords:** Walnut, spleen, retroperitoneal, nephrectomy and hepatoraphy.

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## INTRODUCTION

About 70 to 80% of rural Kashmir is associated with farming and tree climbing is an important part of it. Approximately 10 to 15% are associated with walnut tree harvesting. Trees are associated with significant amount of injury and mortalities especially included trees are coconut, palm and walnut [1]. Falling from a height is one of the major causes of fatal and non-fatal.

Injuries in adults [2]. In Kashmir walnut tree harvesting is a significant occupational source, henceforth associated with risk which needs intervention. Walnut tree fall is implicated as notorious for fall than any other tree because it needs stick or shaking to dislodge the nuts hence forth farmers lose their balance and due to lack of any support, fall to the ground and get injured especially to chest and abdomen[3]. Main problems of the farmers are falling from the highest point of such trees, which occurs due to the presence of worm eaten branches, unpruned trees, and recklessness of some workers during walnut

harvesting [4]. Hence this study was carried with the aim to determine the implicated abdominal injuries from walnut fall.

## MATERIALS AND METHODS

This prospective was carried out in the Accident and Emergency department of General Surgery. SKIMS Medical College over a period of two years from September 2016 to October 2018 during the harvest and immediate post harvest period. All patients were evaluated with history, precise examination and relevant investigations.

## RESULTS

All the cases (60) examined during this time period of two years presenting with injury due to walnut fall were males. Out of total number cases maximum cases of 22 (36.6%) were in the harvesting season of October followed by 16 cases (26.6%) in September. Post harvesting cases were 8 (13%) in November and least in non harvesting period of 4 cases (6%).

**Table-1: Hospital admission as per month**

Month	Cases	Percentage
August	10	16.6
September	16	26.6
October	22	36.6
November	8	13
December	4	6

Majority of the cases were in between 3<sup>rd</sup> to 4<sup>th</sup> decade (27) followed by 2<sup>nd</sup> and 3<sup>rd</sup> decade (15). least number of cases (3) were above 5<sup>th</sup> decade and no

case below 10 years of age. Hence showing maximum piling of cases in young adults.

**Table-2: Age variability**

Age	Cases
Less than 10 years	0
11-20	5
21-30	15
31-40	27
41-50	10
More than 50 years	3

In majority of cases 33 (55.5%) breaking of branches was most common cause and etiology of fall

from walnut tree leading to critical injuries. Least approx 3cases (5%) were idiopathic.

**Table-3: Cause of fall**

Cause	Cases
Slipping	17 (28%)
Breakage of branch	33 (55.5%)
Balance loss	7 (11%)
Idiopathic	3 (5%)

Majority of the cases (18) were having abdominal injuries followed by chest and upper limb

(11) cases each. Least pattern of injury was present in spine (4) cases.

**Table-4: Distribution of injuries**

Distribution of injuries	Cases
Chest	11 (18%)
Abdomen	18 (30%)
Spine	4 (6%)
Head injury	9 (15%)
Upper limb	11 (18%)
Lower limb	7 (11%)

**Table-5: Majority of the intra-abdominal injuries consists of splenic trauma 38% followed by liver 22% and least was retroperitoneal injury of 5%.**

Intra abdominal organ injury	Cases
Splenic injury	7 (38%)
Liver laceration	4 (22%)
Renal injury	2 (11%)
Gut perforation	3 (16%)
Mesenteric laceration	1 (5%)
Retroperitoneal hematoma	1 (5%)

Majority of the splenic cases were of grade 1&2 which required conservative management and 3 cases were of grade 3&4 underwent emergency splenectomy. Liver laceration of grade 1&2 were 3

cases managed conservatively and I case of grade 3 required packing with hepatoraphy. Emergency Nephrectomy was done in one case.

**Table-6: Grading of solid viscera as per trauma**

Solid abdominal viscera	Grade 1 and 2 cases	Grade 3 and 4 cases
Spleen	4	3
Liver	3	1
Kidney	1	1

## DISCUSSION

Morbidity and mortality are important and critical aspects of injuries related to fall from tree [5]. Severity of injuries is dependable upon variety of factors like orientation, surface on which person falls, height [6]. Walnut tree fall is restricted to a particular season in Kashmir, Farmers or labourers involved in harvesting walnuts are mostly injured. In view of being a seasonal injury, emergency health areas of the region are swamped with critically injured persons over a small period of time [7]. Farmers or laborers involved in harvesting walnuts use the conventional methods of climbing the trees and either using a long stick or resorting to vigorous shaking to dislodge the fruit henceforth causing fall. Additionally the slippery nature of the bark adds to the probability of fall. Other pattern of fall is the branch giving way while the worker is on the branch.

Majority of the patients with inflicted injuries were young with an average age of 35 years as per the table 2, this finding is consistent with the results of other studies [8]. More than half of the injured patients were between 2<sup>nd</sup> and 5<sup>th</sup> decade which is consistent with Ersoy *et al.*[9] The cause of young age involvement of workers is to collect fruits to pay for their living expenses. Disabling injuries caused by falling from trees can cause a negative economic impact on them. The cause of this notorious fall can be due to sudden breakage of branch or unpruned tree or

slippery bark of walnut tree, as is evident from table 3 where majority of the cases occur due to sudden breakage 55% followed by slippage 17%.

Skeletal injuries are most commonly inflicted especially fall from walnut tree [10]. Which varied from head injuries (15%), followed by spine (4%) and upper lower limb approximately 18% and 11% respectively as per table 4. Fall from walnut tree causes profound abdominal trauma. The types of abdominal injury depend on the location of landing on the ground or collision of the belly with the branches etc. Spleen is the commonest organ damaged in fall from walnut tree about 38% cases followed by liver 22%. This is same as spleen most common organ damaged in blunt abdominal trauma. Majority of splenic trauma cases were of grade 1&2 managed conservatively and emergency splenectomy was done in 3 cases, similar management and surgical intervention was followed for liver and kidney with conservative in grade 1&2 liver trauma and packing with hepatoraphy in grade 3&4, nephrectomy was done in grade 4 renal injury as is depicted in table 6. Gut perforations were managed with primary closure and mesenteric tears were repaired. There was single case of retroperitoneal hematoma managed conservatively.

Cultivation of grafted walnut trees with the introduction of grafted dwarf walnut trees, incidence of trauma due to fall from a walnut tree can decrease considerably [11]. Imparting proper education to farmers regarding the proper time of harvest of walnut crop will be a safety measure. Legislation allows only the properly trained personnel to carry out harvesting. Stopping small boys climbing walnut trees could avoid injuries in children.

## CONCLUSION

Walnut tree fall is one of the causes of increased emergency rush in Kashmir especially during peak seasons. There is variation in age with majority of inflicted in young adults of 3<sup>rd</sup> to 4<sup>th</sup> decade. Solid viscera injury is most common with spleen mostly inflicted. Proper education, training and legislation will reduce incidence of injury from fall from walnut tree.

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