ACUTE OPEN TENDO ACHILLES INJURIES AMONG THE PATIENTS ATTENDING AT A TERTIARY CARE HOSPITAL OF EASTERN INDIA

Dr. Soumya Gayen1, Dr. Amrita Mukherjee2, Dr. Jayanta Kumar Rout2, Prof. (Dr.) Firdos Ahmed3

1 MS, MCh (Plastic Surgery), Medical College, Kolkata.
2 MD (Biochemistry), Assistant Professor, Department of Biochemistry, R G Kar Medical College, Kolkata.
3 MS, MCh (Plastic Surgery), Calcutta National Medical College, Kolkata.

ABSTRACT

Tendo achilles injuries are very common in this part of the country. The relative incidence of modes and causes of injury are a cause of concern to understand the pattern of prevention and treatment. The study revealed that accidental injury in toilets is more than any other modes of trauma.

INTRODUCTION:

The term “Achilles’ heel” means a person’s vulnerable spot or area. It is derived from the Greek myth of Achilles and his mother Thetis. Paris, Prince of the Trojans, shot an arrow in the heel of Achilles as the heel was not touched by immortality, Achilles died. The mythology of Achilles not only led to coining of the term “Achilles’ heel,” but also the tendon connecting the heel to the calf muscles was named as the “Achilles” tendon.1

The Achilles tendon is the most commonly ruptured tendon in the human body2. The injury was uncommon until the 1950’s, but the incidence of Achilles tendon rupture has increased over the past two decades. Tendo achilles cut injury is most common tendon injury. Most of the cases in the western countries are caused due to sports injury. Other causes are road traffic accident (RTA) and direct trauma (accidental cut).3

In India another common type of injury is due to slipping of foot in Indian type of lavatory pans. The fall results in slipping of one foot into the hole of a pan and thereby sustaining sharp cut injury to the skin overlying Achilles tendon and laceration of the tendon itself. Squatting habit and the need to place the feet on the sides of the pan hole of a lavatory pan presumably lead to such accidents. There is a definite pattern of injury depending upon technique of extraction of the feet out of the hole of the pan. Absence of help and panic add to the problem as the patient is alone during injury.4

Overall incidence of Achilles tendon injury increased over recent years as shown by various studies. Age and sex distribution of the patients also depicts a particular picture.

In our present study we have searched for the causative factors of injury in our tertiary care hospital in Eastern India, as well as we have tried to make an epidemiological pattern of Achilles Tendon injury so that our mode of treatment can be directed accordingly.
MATERIAL AND METHODS

STUDY AREA

Patients were selected from Plastic surgery Out Patient Department which is under the Department of Plastic Surgery, Medical College and Hospital, Kolkata. A comparative study was undertaken in the Department of Plastic Surgery, Medical College and Hospital.

STUDY POPULATION

Patients having repaired Achilles tendon injury with an overlying soft tissue defect at the follow up visit which is usually after one week of primary repair of Tendo achilles, attending the Department of Plastic Surgery, Medical College and Hospital, Kolkata.

SAMPLE SIZE

The study was conducted in a series of 40 patients with Tendo achilles injury who attended Department of Plastic Surgery.

TECHNIQUE

The patients were interrogated thoroughly for proper history. Data was analyzed with proper statistical methods.

RESULTS

Statistical Analysis:

Statistical Analysis was performed with help of Epi Info (TM) 3.5.3 which is a trademark of the Centers for Disease Control and Prevention (CDC).

Using this software, basic cross-tabulation and frequency distributions were prepared. $\chi^2$ test was used to test the association between different study variables under study. Corrected $\chi^2$ test was used in case of any one of cell frequency was found less than 5 in the bivariate frequency distribution.

Test of proportion (Z-test) was used to test the significant difference between two proportions. t-test was used to test the significant difference between means.

Odds ratio (OR) with 95% Confidence Interval (CI) was calculated to measure the different risk factor. Significance level was set at 0.05 and confidence intervals were at 95 percent level. Thus p <0.05 was considered statistically significant.

OVERALL FINDINGS OF THE PATIENTS UNDER STUDY:

Table-1: Age Distribution

<table>
<thead>
<tr>
<th>Age Group (in years)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-29</td>
<td>14</td>
<td>35.0%</td>
</tr>
<tr>
<td>30-39</td>
<td>7</td>
<td>17.5%</td>
</tr>
<tr>
<td>40-49</td>
<td>9</td>
<td>22.5%</td>
</tr>
<tr>
<td>50-59</td>
<td>6</td>
<td>15.0%</td>
</tr>
<tr>
<td>60-69</td>
<td>4</td>
<td>10.0%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

The mean age (mean ± S.D.) of the patients was 38.07±13.07 years with range 19 – 62 years and the median age was 36.0 years.
Most of the patients (35.0%) were within 30 years of age which was significantly higher than that of other ages (Z=2.81; p=0.005). Only 10.0% of the patients were with age ≥60 years. Thus the injuries were more prevalent within the 30 years of age.

Table-2: Gender Distribution

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>28</td>
<td>70.0%</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>30.0%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Male:Female</td>
<td>2.3:1</td>
<td></td>
</tr>
</tbody>
</table>

Proportion of males (70%) was significantly higher than that of females (30%) (Z=5.65;p=0.0001). The Male:Female ratio was 2.3:1. So males were more prone to have an injury.
Chi-square test showed that there was significant association between age and gender (p=0.0001).

The mean age (mean ± S.D.) of the males was 42.78±11.92 years with range 19 - 62 years and the median age was 43.5 years.

The mean age (mean ± S.D.) of the females was 27.08±8.28 years with range 19 – 51 years and the median age was 25.5 years.

$t$-test showed that the mean age of the males was significantly higher than that of females ($t_{38}=4.14; p=0.0001$). It may be concluded that prevalence of injuries were more frequent among aged males than that of females.
Table-4: Distribution of mode of injury

<table>
<thead>
<tr>
<th>Mode of injury</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet Pan Injury</td>
<td>25</td>
<td>62.5%</td>
</tr>
<tr>
<td>Accident</td>
<td>10</td>
<td>25.0%</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

62.5% of the patients had toilet pan injury which was significantly (Z=5.34; p=0.0001) followed by accident (25%). Only 12.5% had other injuries.
Table-5: Distribution of Compliance to follow up

<table>
<thead>
<tr>
<th>Compliance to Follow Up</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliant</td>
<td>35</td>
<td>87.5%</td>
</tr>
<tr>
<td>Lost to follow up</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

87.5% of the patients were compliance to follow up at 6 month which was significantly higher (Z=10.60; p=0.0001).

DISCUSSION

Hippocrates, in the first recorded description of an injury to the Achilles tendon, stated that “this tendon, if bruised or cut, causes the most acute fevers, induces choking, deranges the mind and at length brings death.” Ambroise Paré, in 1575, recommended that a ruptured Achilles tendon be strapped with bandages dipped in wine and spices, but advised that the result was dubious. Operative repair of a ruptured Achilles tendon was advocated in 1888 by another Frenchman, Gustave Poilâillon, although an Arabian physician performed such procedures as early as the tenth century A.D. In the twelfth century, an Italian surgeon, Guglielmo di Faliceto, believed that nature was unable to unite divided tendons and that operative treatment was necessary. In a retrospective study from a prospectively collected data Maffulli et al commented that the overall incidence of Achilles tendon rupture increased from 4.7/100,000 in 1981 to 6/100,000 in 1994, with a peak in 1986. In men, the incidence rose from 6.3/100,000 to 7.3/100,000. In women, the increase in incidence was more pronounced, from 3/100,000 to 4.7/100,000. In men, peak incidence rate occurred in the 30- to 39-year age group, whereas in women, the peak age-specific incidence occurred in those aged 80 years and older, with a steady increase after age 60. There was no evidence of seasonal variation in the rate of occurrence of Achilles tendon rupture. A bimodal distribution of age at time of Achilles tendon rupture was noted. In a sixteen year old (1979-1994) study conducted by Juhana Leppilahti et al peak incidence occurred in the age group 30-39 years, and the incidence curve was flatter in older age groups. A biphasic pattern became obvious when the age specific
incidences were divided into sports-related injuries and others, the patients in the nonsports-group being older (mean age 53 vs 38 years, p < 0.001)7.

Leppilaihi et al found that four fifths of the ruptures were related to sports activities. 88% of the injuries occurred in ball games requiring sudden acceleration or jumping. Although there are both inter and intra national differences in the frequencies of different sports, ball games account for over 60% of the ruptures in many series7.

Other mechanisms by which the Achilles tendon can be torn involve sudden direct trauma to the tendon, or sudden activation of the Achilles tendon after atrophy from prolonged periods of inactivity. Some other common tears can occur from overuse while participating in intense sports. Twisting or jerking motions can also contribute to injury. Fluoroquinolone antibiotics, famously ciprofloxacin, are known to increase the risk of tendon rupture, particularly Achilles8.

Regarding gender distribution in overall proportion of males (70%) was significantly higher than that of females (30%) (Z=5.65; p=0.0001). Thus the injuries were more prevalent among males. The result is more consistent with the study of Maffulli et al who showed a higher incidence in male though it was not statistically significant.

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But in Indian scenario although there is no significant data regarding the percentage of occurrence of mode of injury our study with over 40 patients revealed that 62.5% cases were due to toilet pan injury in Indian style pan which is severely uncommon in the West. However MK Alam et al commented that most of the cases this is due to fall in the toilet pan, followed by cut injury over tendoachilles. Another study in India Dr.Sasanka.S.Chatterjee et al commented that injuries due to lavatory pans are peculiar to the third world, crowded urban set up in South Asia where the population and available toilet facility ratio demands quick turnover and therefore hurry. The design of the pan and need to squat invites slipping of foot into the hole of pan. World literature has no mention of this type of injury7. Other causes are road traffic accident (RTA) and direct trauma (accidental cut)7. Sports injuries are relatively very few here as people are not much engaged with outdoor sports as well injuries due to accidents are also taken a fair percentage (25%). Fluoroquinolone antibiotics, famously ciprofloxacin, are known to increase the risk of tendon rupture, particularly Achilles8 but we did not get any case concerned with drugs.

REFERENCES:

6. Clinical Journal of Sport Medicine:July 1999 Changing Incidence of Achilles Tendon Rupture in Scotland: A 15-Year Study. Maffulli, Nicola MD, MS, PhD, FRCS(Orth); Waterston, Stuart W. BMedSci; Squair, Janet Bsc, Msc; Reaper, Jacqueline BMedSci; Douglas, Stuart DSc, FRCP.

Contribution of the team:
Prof. (Dr.) Firdos Ahmed guided the study with his valuable opinion and ideas. Dr. Jayanta Kumar Rout and Dr. Amrita Mukherjee performed statistical analysis and helped in manuscript drafting. Dr. Soumya Gayen performed collection and processing of data followed by manuscript drafting.