

Summary

Background: Acute Achilles ruptures are regarded as very rare in the under-20 years' old age group.

Material and Methods: Four teenage elite gymnasts with five acute Achilles tendon ruptures are presented. The mean age at rupture was 18 years and 7 months. Three athletes were female and one male. Each was involved in high-level Gymnastics and underwent prompt open repair followed by an accelerated rehabilitation programme. Additionally a review of the literature in this area is presented.

Results: Each Gymnast returned to the same level and beyond following successful surgery and rehabilitation.

Conclusions: Teenagers do sustain Achilles ruptures but appropriate management can allow them to pursue high levels of sporting attainment.

Keywords

Achilles tendon– acute rupture– teenagers– artistic gymnastics

W.J. Ribbans et al.

Akute traumatische Achillessehnenrupturen bei Geräteturnern/innen im Teenageralter

Zusammenfassung

Hintergrund: Akute Rupturen der Achillessehne sind in der Altersgruppe der unter 20jährigen äußerst selten.

Material und Methode: Im Rahmen der vorliegenden Arbeit werden 4 Elite-Turner und -Turnerinnen (3 Frauen und ein Mann) mit insgesamt 5 akuten Achillessehnenrupturen vorgestellt. Der Altersdurchschnitt lag bei 18 Jahren und sieben Monaten. Alle Athletinnen und Athleten waren Leistungssportler und wurden sofort nach der Verletzung mittels offener Achillessehnennaht operiert. Alle erhielten im Anschluss an die Operation ein proaktives Rehabilitationsprogramm. Zusätzlich zu den Fallvorstellungen wird eine Übersicht der aktuellen Literatur präsentiert.

Ergebnisse: Alle Athletinnen und Athleten konnten nach Abschluss der

ORIGINAL ARTICLE

Achilles tendon ruptures in teenagers involved in elite gymnastics

William J. Ribbans¹, Philip D. Henman², William H. Bliss²

¹University of Northampton, England, United Kingdom

²Freeman Hospital, Newcastle, England, United Kingdom

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Introduction

Acute ruptures of the Achilles tendon is a common injury that can be associated with long-term disability. With increasing participation in sport the incidence appears to be rising [4]. The majority of ruptures occur during sporting activities – 68% in Raikin's study [16] with the incidence higher in those patients younger than 55 years old (77%). Return to sport following Achilles tendon rupture is not guaranteed. Möller [12] reported that only 54% of patients had returned to their pre-injury sport at 12 months. Bhandari [2] reported a "return to function" rates of 71% for operatively treated patients falling to 63% for those treated conservatively.

Tendo Achilles ruptures in the teenage group is regarded as very unusual [6] and Nyssönen [13] reported that Achilles ruptures in the under-20 year old group accounted for less than 1% of acute ruptures but gave no further analysis. The authors are not aware of any previous case series highlighting this injury specifically in the young or in elite gymnasts.

This paper presents a case series of four teenage gymnasts with five acute Achilles tendon ruptures. All

competed at a high level of sport and each returned successfully to the same level and beyond following surgery and rehabilitation.

Materials and methods

The clinical records of one surgeon (WJR) were examined for examples of acute Achilles tendon ruptures in young patients. Five examples of ruptures were identified in four gymnasts. A sixth rupture in a 17-year old male soccer player within the academy of a major English club has also presented and is in the early post-operative months of rehabilitation.

Therefore this case series reports upon the cohort of gymnasts for whom there is a longer and more complete follow-up. There were three females (four ruptures) and one male (one rupture) with an average age of 18 years and 7 months. The average follow-up is 68.4 months (range 29–123 months). All ruptures were complete and occurred either in the mid-tendon region (Cases 1, 3 and 4) or close to the musculotendinous junction (Cases 2 and 5). Post-operative recovery was based upon clinical records, review of published gymnastics competition records and updated information

Therapie ihre gewohnte sportliche Aktivität auf gleichem, zum Teil auch auf höherem Niveau ausüben.

Schlussfolgerung: Auch Teenager können, wengleich selten, eine akute traumatische Ruptur der Achillessehne erleiden. Ein zeitnahes, adäquates Management dieser Sonderform der Achillessehnenrupturen erlaubt es durchaus, auch Spitzensport ohne Einschränkungen auf höchstem Niveau auszuüben.

Schlüsselwörter

Achillessehne– akute rupturen– Teenager– Turnen

supplied by the patients. All patients have given written consent to report upon their injuries and subsequent progress.

Cases

Surgery

All surgeries were undertaken by the three authors within the first week following injury.

All cases underwent an open repair using a medial vertical incision. The ruptures were repaired using a Kessler technique with epitendinous augmentation for additional strength.

Rehabilitation

Following surgery all four patients and five ruptures spent two weeks in a cast in slight plantarflexion and four weeks in a hinged brace to allow active plantarflexion. At six weeks, the braces were removed and cushioned gel pads placed in the patients' shoes, which were progressively reduced in height up to week 12. The patients underwent a progressive programme of mobilisation, strengthening and proprioceptive drills from week 6.

All the patients were rehabilitated by experienced physiotherapists involved with the national gymnastics squads.

Case 1

A female aged 18 years and 11 months ruptured her right Achilles tendon in May 2006. She had been an international Tumbling Gymnast for 5 years prior to her Achilles tendon rupture. She had had no previous Achilles problems. Her Achilles felt tight in the warm up and ruptured at the end of her tumbling routine during an international competition.

At 9 weeks, she could single stance tip-toe and was back in full gymnastics training at 20 weeks. She

returned to the national gymnastics team for a further three years. After retirement from competitive gymnastics she became a professional acrobat in a multinational company travelling the world for five years.

Case 2

A female aged 19 years and 0 months ruptured her right Achilles tendon in January 2011. She was an international Artistic Gymnast and competed in the 2008 Beijing Olympics. She had had no previous Achilles problems. The tendon ruptured during training for a Floor routine.

At 7 weeks, she was training on the single bar and 8 weeks was training on the uneven bars. At nine months, she returned to full competition and came 5th in the World Championships team competition. In the next four years, she won seven medals at Commonwealth, European and World Championships. She has competed in the 2016 Olympics.

Cases 3 and 4

A female aged 16 years and 8 months sustained a rupture of her right Achilles tendon in May 2011. She was an outstanding junior Artistic Gymnast. She had felt a tightness in her Achilles for several days prior to the rupture. She underwent an open repair by her local Orthopaedic surgeon (WHB) and referred on by the British Gymnastics medical team to WJR for advice on rehabilitation. By 17 weeks she was running and at nine months back in full gymnastics training. She returned to full competition.

In late 2013, she developed symptoms suggestive of a left non-insertional Achilles tendinopathy and then in March 2014 sustained a full rupture of the left Achilles during a training session for a Floor Routine (19 years and 5 months). She underwent prompt open surgery by her

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