A Historical Record of Traumatic Rupture of Dupuytren's Contracture

M. SIROTAKOVA and D. ELLIOT

J Hand Surg [Br] 1997 22: 198
DOI: 10.1016/S0266-7681(97)80062-9

A HISTORICAL RECORD OF TRAUMATIC RUPTURE OF DUPUYTREN'S CONTRACTURE

M. SIROTAKOVA and D. ELLIOT

From St Andrew's Centre for Plastic Surgery, Billericay, Essex, UK

Traumatic rupture of Dupuytren's contracture is rare. It has been reported only twice in recent times and only on four previous occasions over the last millenium. These cases are reported and the forces involved in rupturing Dupuytren's contracture are discussed.
Journal of Hand Surgery (British and European Volume, 1997) 22B: 2: 198–201

Traumatic rupture of Dupuytren's contracture bands has only been recorded in two patients in the last 20 years (Grace et al, 1984), although it is possible that the actual occurrence is higher. It is, nevertheless, an unusual event.

This paper presents the results of a search of the historical literature for cases of traumatic rupture of Dupuytren's disease and a discussion of the forces involved.

CASE REPORTS

Case 1, c.1200

> On another occasion it happened that, being delighted to have him [the priest Guðmundr] as a guest, they found a woman to massage his feet when he went to bed*; and, although he was not keen on such things, he, out of sensitivity, did not want to refuse, since it was devotion which prompted the service. This woman had a hand unusable for work, since three fingers lay clenched into her palm; and, as she rubbed, it seemed to Father Guðmundr as though she was working too slowly, and he thrust his foot against the foot-board. The crippled fingers came in between, so that his heel came into the rounded part, right onto the tendon which had contracted. But in exchange for the pain which the woman felt at this, she found the reward that within a few nights those same fingers were straight. She then showed them to the man of God; he praised God for it, taking no credit to himself for a deed of this kind.
>
> (*The Saga of Guðmundr* by Arngrimr Brandsson, c.1200.)

Case 2, 1787 (Fig 1)

> The fingers are subject to a contraction particularly those of laborious people such as Watermen et cetera. It most frequently takes place in the little finger; this is found to arise from a thickening and shortening of the ligamentum theca, which covers the tendons of the flexor muscles passing to the fingers, and in cases of this kind a hard rigid substance is found situated under the Cutis ... Mr Cline once knew a case of thickened theca cured by accident—a patient letting a large book fall on his fingers by which their motion was recovered.
>
> (Cline, 1787)

Case 3, 1863

> I have met with cases of this affection in which a contracted finger had been forcibly straightened by accident. One instance occurred in a gentleman, aged 45, who had the middle finger of one hand contracted from this cause. About 2 years ago, when getting over a hedge, the finger was forcibly straightened, and has remained perfectly well ever since.
>
> (Annandale, 1865)

Case 4, 1864

> It had never occurred to me to have the opportunity of dissecting one of these finger contractions; but on the 15th of April, 1864, a gentleman, Mr L, aet. 50, residing at Hampton Court, who suffered from Dupuytren's contraction of the fourth and fifth fingers in each hand, and upon whom I had proposed to operate, met with an accident. In attempting to hold a restive horse, the contracted fingers on the right hand were suddenly torn open, and the skin in the palm torn across. I saw him shortly after the accident, when the hand had been merely tied up by a handkerchief, and found a large gaping wound in the palm of the hand, reaching nearly half way across. The palmar fascia had been torn across, together with the skin, but the sheaths of the tendons were not torn, and it was evident that these structures had not been implicated in the contraction. The tendons in their sheaths were seen lying at a depth from the surface, running along the concavity of the curve, in proximity with the bones, whilst the fascia had evidently been stretched across like the string of a bow. After cutting away a few torn threads of fascia, I found, on attempting to extend the fingers, that the previously transverse wound assumed a loz-

*The practice of stroking the feet by servants was common in Nordic households and is generally considered to have been an aid to sleep.

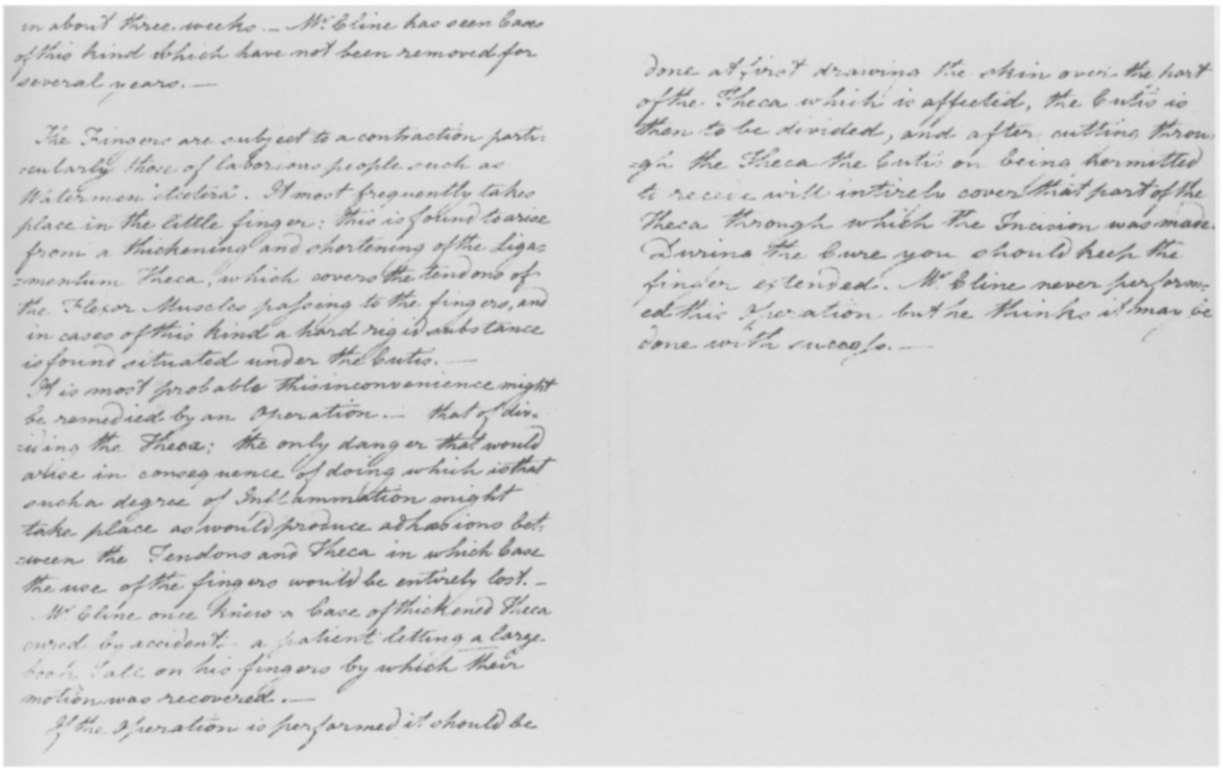

Fig 1 Photograph of text from the notes of Richard Whitfield, a student in St Thomas' Hospital, London recording the contents of a lecture given by Mr Henry Cline Senior, in 1787. (Reproduced with the kind permission of the UMDS Library Services of Guy's and St Thomas's Hospitals, London.)

enge-shape in a perpendicular direction. I therefore approximated the edges laterally and introduced sutures, so that when sewn up it resembled a longitudinal instead of a transverse wound. The hand was firmly bound round with narrow strips of plaster and bandaged to a splint with the fingers in an extended position. On the third day the wound presented a healthy appearance, without any suppuration, and I therefore removed the sutures. The healing process proceeded without interruption, and the fingers remained nearly straight, without their power of flexion being lost.

(Adams, 1879)

Case 5, 1984

A 79-year-old male presented with an open wound of the hand. He had fallen from a chair landing on the outstretched hand. He described a contracture of the hand at the metacarpophalangeal joint of the ring finger of some 10 years duration. The contracture had been relieved by the fall. There was an open wound at the base of the ring finger between the distal palmar crease and proximal finger crease and this wound could be closed by flexing the metacarpophalangeal joint. There were palmar nodules proximally and distally and distortion of the distal palmar crease in keeping with a diagnosis of Dupuytren's contracture ... The wound was treated by simple dressings and healed ... Following healing the hand remained straight and there was no recurrence of joint contracture 2 years later although the skin remained tight.

(Grace et al, 1984)

Case 6, 1984

A 66-year-old man with a 10- to 12-year history of a hand contracture was examined and photographed. The diagnosis of Dupuytren's contracture was made with a severe contracture of the proximal interphalangeal joint of the ring finger and the patient was admitted some time later but the hand was found to be straight. The patient described a traumatic incident 15 months previously when the fingers were forcibly extended. Apparently he was winding the starting-handle of a Morris Minor when the engine backfired. He felt a great deal of pain across the base of his right ring finger. He looked at his hand and there was a split through the skin. Slowly he was able to get his finger out straight. Having done his own "operation" he then proceeded to give himself physiotherapy and the contracture did not recur.

(Grace et al, 1984)

DISCUSSION

We have been able to find only five definite and one possible record of traumatic rupture of Dupuytren's contracture in the European literature between the 12th and 21st centuries. This is surprising in that traumatic hyperextension injuries of the finger are not uncommon. Most of the above cases appear to have been injured by relatively small forces (Table 1) and it is possible that the rarity of traumatic rupture of Dupuytren's disease is less a feature of the strength of the bands than the fact that a finger flexed by contracture is less likely to suffer a hyperextension injury because of the difficulty in getting between the fingertip and the palm to apply the necessary deforming force. However, we are aware of one case in which a man with Dupuytren's disease of the little finger fell on his outstretched hand and sustained a spiral fracture of that finger without rupture of the Dupuytren's band (McGrouther, personal communication).

In 1831, Dupuytren attempted to overcome the flexion force of the disease by hanging weights from the finger (Fig 2). He hung weights of approximately 50 to 75 kg from his patients' fingers, presumably for short periods of time, but was unable to rupture the bands. In fact, this experiment was more likely to have stretched the bands than ruptured them and could be considered to have been the first application of slow continuous traction to Dupuytren's disease. Dupuytren's attempt to quantify the force required to rupture the contracture does not appear to have been repeated since 1831 and the therapeutic potential of such an extension force was not harnessed until 1968 when Chamraev, in Russia, pioneered the technique of continuous slow traction (Fig 3), more recently re-described in Italy (Messina, 1989; Messina and Messina, 1991; 1993; Motta et al, 1989). Slow traction appears to achieve extension by biochemical rearrangement rather than by tissue rupture (Bailey et al, 1994; Brandes et al, 1994) and does not achieve the permanent relief of contracture effected by traumatic rupture.

Table 1—Aetiology of traumatic rupture of Dupuytren's disease

Case	*Year*	*Mechanism of rupture*
1	c.1200	Kick by human foot
2	1787	Falling book
3	1863	Climbing over hedge
4	1864	Torn by reins of restive horse
5	1984	Fall from chair
6	1984	Backfire of motor vehicle starting handle

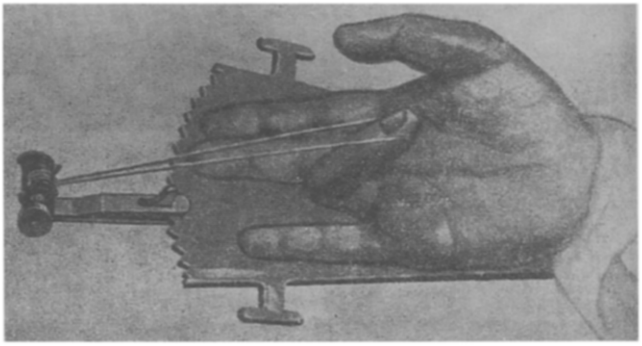

Fig 3 The apparatus used by Chamraev to provide slow extension of Dupuytren's contracture (Chamraev, 1968).

Malgré toutes ces apparences d'une lésion profonde, les articulations des doigts affectés ne présentent aucune trace d'ankylose, et, sans excepter celle de la première phalange, elles sont très mobiles dans le sens de la flexion: mais elles ne sauraient être étendues au-delà d'un certain point, quels que soient les efforts que l'on fasse; et, an effet, nous avons vu plus d'une fois que des poids de cent, et même de cent cinquante livres, pouvaient être appendus à l'espèce de crochet que forme le doigt, sans que pour cela son angle de flexion fût ouvert d'une ligne.

Fig 2 The text of Dupuytren's paper in 1831 in which he described hanging weights from fingers from affected fingers. "Despite having all the features of a deep lesion, the joints of the affected digits show no trace of ankylosis, and, even including those of the first phalanx, they flex freely: but they cannot be extended beyond a certain point, no matter how hard one tries; and, in fact, on more than one occasion we have seen that a weight of 100, and even 150, livres* could be hung from the hook formed by the finger, without its angle of flexion straightening at all." (Translation)

*The livre was a French weight used in Dupuytren's time which has been obsolete since before 1900. It was equivalent to the modern weight of 489.5 g and is still used commonly in France to designate the weight of 500 g or 0.5 kg—approximately 1.1 lb.

Acknowledgement

We would like to thank the Editor of the *Journal of Hand Surgery* (British and European Volume) for permission to reproduce cases 5 and 6.

References

Adams W. *Observations on the contraction of the fingers (Dupuytren's contraction)*. Churchill, London, 1879: 11–12.

Annandale T. *The malformations, diseases and injuries of the fingers and toes and their surgical treatment*. Edmonston and Douglas, Edinburgh, 1879: 244.

Bailey AJ, Tarlton JF, Van der Stappen J, Sims TJ, Messina A (1994). The continuous elongation technique for severe Dupuytren's disease. A biochemical mechanism. Journal of Hand Surgery, 19B: 522–527.

Brandes G, Messina A, Reale E (1994). The palmar fascia after treatment by the continuous extension technique for Dupuytren's contracture. Journal of Hand Surgery, 19: 528–533.

Chamraev SS (1968). Set of instruments for surgery of Dupuytren's contracture of the fingers (trans. from Russian). Ortopedia, Traumatologia Protezia, 29: 84–86.

Cline H, Snr. Notes of Richard Whitfield (student) from a lecture by Henry Cline Senior. Manuscript 30, St. Thomas's Hospital Medical School Library, London, 1787.

Dupuytren G (1831). De la rétraction des doigts par suite d'une affection de l'aponévrose palmaire—description de la maladie—operation chirurgicale qui convient dans ce cas. Compte rendu de la clinique chirurgicale de l'Hôtel Dieu par MM les docteurs Alexandre Paillard et Marx. Journel Universel et Hebdomadaire de Médecine et de la Chirurgie Pratiques et des Institutions Médicales, 5: 349–365.

Grace DL, McGrouther DA, Phillips H (1984). Traumatic correction of Dupuytren's contracture. Journal of Hand Surgery, 9B: 59–60.

Guðmundr (c.1200). Saga Guðmundr Arasonar by Arngrimr Brandsson, Perg. Fol. nr. 5, Royal Library, Stockholm, 1350–65. Printed in Biskupa sögur [ed. Guðbrandur Vigfússon and Jón Sigurðsson] Copenhagen, 1858–78, vol II, p 29. translated by Whaley, DC, Elliot D (1993). Dupuytren's Disease: a Legacy of the North? Journal of Hand Surgery, 18B: 363–367.

Messina A (1989). La TEC (tecnica di estensione continua) nel morbo di Dupuytren grave: Dall'amputazione alla riconstruzione. Rivista di Chirurgia Della Mano, 26: 253–257.

Messina A, Messina J (1991). The TEC treatment (continuous extension technique) for severe Dupuytren's contracture of the fingers. Annals of Hand and Upper Limb Surgery, 10: 247–250.

Messina A, Messina J (1993). The continuous elongation treatment by the TEC device for severe Dupuytren's contracture of the fingers. Plastic and Reconstructive Surgery, 92: 84–90.

Motta P, Ebrichiello C, Crovella U (1989). Estensione articolare progressiva nel trattamento del morbo di Dupuytren e delle rigidità articolari in flessione. Rivista di Chirurgia Della Mano, 26: 259–262.

Received: 14 June 1996
Accepted after revision: 22 August 1996
D. Elliot, St Andrew's Centre for Plastic Surgery, Billericay, Essex, UK.