

“Is this case of a very rare disease work-related?” A review of reported cases of Pacinian neuroma ¹

by Francesca Zanardi, MD, Robin MT Cooke, MA, Antonino Maiorana, MD, Stefania Curti, MStat, Andrea Farioli, MD, Roberta Bonfiglioli, MD, Francesco Saverio Violante, MD, Stefano Mattioli, MD ²

1 Appendix – Table 1

2 Corresponding author [e-mail: s.mattioli@unibo.it].

Appendix: Table 1

Appendix: Table 1. Summary of main available clinical and occupational characteristics of reported cases of pacinian neuroma. Descriptions of signs/symptoms refer to the site of the lesion, except when specified. Traumas were categorized as “very recent” if they occurred at 1 week to 6 months from onset/presentation; “recent”, 6 months to 2 years; or “remote”, ≥2 years. Details not specified (time of trauma, right/left hand etc) were not available (NA).

Reference	Case	Age at diagnosis/ gender	Localization and histology	Signs and symptoms	History of trauma of the hand (temporality)	Occupational history (sports/hobbies)	Other pertinent information (treatment outcome)	Summary
Patterson, 1956 (5)	1	33/F	Right thumb, pulp: gross excess of large/small pacinian corpuscles ^a (similar nodule on left thumb not explored)	Large swellings in both thumbs (larger on the right) which interfered with work; no sensation abnormalities	N/A	Comptometer operator	Onset presumably during childhood; interpreted by authors as a developmental abnormality (outcome not reported)	Unclear
Zweig et al, 1968 (4)	2	54/M	Right palm: circumscribed masses (2 × 3 mm) in each of the common digital nerves ^a	Complete loss of sensation of palmar aspect of thumb and 3 rd finger; no pain	Penetrating injury by a large splinter in right palm at work (almost 5 months before diagnosis) requiring reparative surgery	Carpenter	Apparently 5 nodules (resolved after resection)	Case following a definite very recent local trauma at work and reparative surgery
	3	42/F	Left palm: circumscribed mass (2 × 5 mm) in radial digital nerve ^a	Pain in metacarpal zone between 2 nd and 3 rd fingers	Fracture of left 4 th metacarpus at home (6 weeks before onset)	Nurse	Resolved after resection	Case following a definite very recent local trauma (not occupational)
Hart et al, 1971 (6)	4	66/F	Right 2 nd finger, radial aspect of finger tip of: stringy tangled rice-sized nodules attached to each other and to fine terminal branches of digital nerves ^a	1 year history of debilitating pain in 2 nd finger whenever touched	No	Housewife	Whiplash injury to right shoulder 8 months before onset. Right-handed (resolved after resection)	Unclear
Sandzen & Baksic, 1974 (7)	5	59/F	Left hand, between 4 th and 5 th fingers: unencapsulated mass (2 × 1 × 1.5 mm) close to the common digital nerve ^a	Painful nodule	Car accident injury (2 weeks before onset)	N/A	Resolved after resection	Case following a definite very recent local trauma (presumably not occupational)
	6	21/M	Right 3 rd finger: grapelike cluster of pacinian corpuscles close to common digital nerve ^a	Pain and tenderness noted while bowling prompted identification of small mass (palmar aspect at the base of right 3 rd finger)	No	N/A (bowling)	Sudden onset during nine pin bowling - an activity which can cause repetitive contusion (resolved after resection)	Case following possible local repetitive micro-trauma (not occupational)
Rhode & Jennings, 1975 (8)	7	44/M	Left palm, 3 nodules between distal 2 nd and 3 rd metacarpal: grapelike cluster (5 × 12 mm), rice-like body (5 mm), and smaller group of pacinian corpuscles; all connected to the common digital nerve ^a	Intermittent pain (in left wrist and 4 th and 5 th fingers); tenderness (in left hypothenar eminence); hypersensitivity (over the left ulnar nerve distribution)	“Mild” crushing injury of left hand in an industrial accident (3.5 years before onset)	Carpenter	Resolved after resection	Case following a definite remote local trauma at work

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Table 1. Continued.

Reference	Case	Age at diagnosis/ gender	Localization and histology	Signs and symptoms	History of trauma of the hand (temporality)	Occupational history (sports/hobbies)	Other pertinent information (treatment outcome)	Summary
Cameron, 1976 (9)	8	17/F	Thumb (side not specified): convoluted, encapsulated mass (8 mm) entrapping the lateral digital nerve, which resembled a huge, malformed pacinian corpuscle ^a	Numbness and hypersensitivity for 4 months, eventually leading to avoidance of contact	N/A	Nurses' aide	Resolved after resection	Unclear
Tadao et al, 1977 (10)	9	50/F	Right palm: dendritic groups of 6 pacinian corpuscles (slightly smaller than a grain of rice); each group attached by a fine nerve fibres to the palmar digital nerve at the radial aspect of the 5 th finger ^a	Intense pain in palm; involuntary reaction even to light pressure	Fractured (and splinted) metacarpal of 4 th finger of right hand 20 years before presentation, after which the pain seemed to continue in the palm	Cook	Glomus tumour (2 relapses after resection; eventually resolved following 3 rd resection of pacinian corpuscles at 4 years from presentation)	Case following a definite remote local trauma
Schuler & Adamson, 1978 (11)	10	47/F	Left 2 nd finger, pulp: mass (5 × 5 mm) involving several digital nerve branches ^a	Intense pain and tenderness	No	Housewife	Resolved after resection	Unclear
	11	55/M	Left 5 th finger: grapelike cluster (4 × 6 mm) of pacinian corpuscles attached to digital nerve ^a	Long history of pain	Lacerating wound of left 5 th finger (10 years before diagnosis, presumably before onset)	N/A	Resolved after resection	Case presumably following a remote local trauma
Chavoïn et al, 1980 (12)	12	51/M	Left hand, 2 nodules: grapelike cluster (3 × 4 mm) in 3 rd metacarpal and collateral nerve of 2 nd finger; many dystrophic pacinian corpuscles along digital nerve of 3 rd finger ^a	Intense pain, initially radiating from 3 rd finger	Occupational accident requiring immediate amputation of distal phalanx of left 2 nd finger (1.5 years before first diagnosis)	Unskilled manual railway worker mounting overhead electricity cables	Trauma was complicated by recurrent infection (treated by complete amputation of 3 rd finger and translocation of 2 nd finger)	Case following a definite recent local trauma at work
Gama & Franca, 1980 (13)	13	35/F	Right thumb: Small unencapsulated mass closely related to the radial digital nerve ^a	Intense pain and numbness accompanied by swelling radiating from interphalangeal joint of right thumb	Contusion on the volar aspect of right thumb (no more than 20 days before onset)	N/A	Resolved after resection	Case following a definite very recent local trauma
	14	23/F	Right hand: irregular unencapsulated cluster of numerous pacinian corpuscles involving ulnar digital nerve of 4 th finger and radial digital nerve of 5 th finger at the metacarpo-phalangeal joint	Intense pain and sensory disorder	Perforating wound in right 4 th finger (no more than 1.5 months before onset)	N/A	Resolved after resection	Case following a definite very recent local trauma
Greider & Flatt, 1982 (14)	15	69/M	Right 2 nd finger, pulp: nest of enlarged pacinian corpuscles on ulnar side	10-year history of intensifying, throbbing pain at tip of finger (aggravated by heat or cold) and radiating to rest of hand	Accident (40 years earlier) at the ulnar aspect of right 2 nd finger while dismantling a piano	N/A	Comorbidity: glomus tumour in right 5 th finger (resolved after resection)	Case following a definite remote local trauma (presumably occupational)

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Table 1. Continued.

Reference	Case	Age at diagnosis/ gender	Localization and histology	Signs and symptoms	History of trauma of the hand (temporality)	Occupational history (sports/hobbies)	Other pertinent information (treatment outcome)	Summary
Yasunaga et al, 1983 (15)	16	72/M	Right thumb: large number of enlarged pacinian corpuscles (1–3 mm) in pulp (up to 1 cm deep)	Intense paroxysmal pain in ventral part of thumb	N/A	Welder (retired 16 years before onset)	Comorbidity: glomus tumor (3 mm) below the pacinian neuroma. Family members experienced similar symptoms (resolved after resection)	Unclear
	17	41/F	Right 2 nd /3 rd finger: grapelike clusters of pacinian corpuscles (N=41) between 2 nd and 3 rd finger close to digital nerve	Swelling; pain when moving right 2 nd finger	No	Housewife	Family members experienced similar symptoms (N/A)	Unclear
Lang-Stevenson, 1984 (16)	18	60/M	Right 3 rd and 4 th fingers: superabundance of large (>4 mm) pacinian corpuscles in both digital nerve ^a	Non-symptomatic (presumably)	Recent ragged-edged cutting wound of right 3 rd and 4 th fingers caused by a circular saw	Skilled manual power tool worker (Braille reader, 80 pages/hour, and accomplished musician)	Incidental surgical finding interpreted by authors as a paraphysiological, hypersensitivity response	Unclear
Friedman et al, 1984 (17)	19	18/F	Right 2 nd finger: mass (2 × 5 mm) within the radial digital nerve ^a	Functional limitation and intense pain at base of finger, radiating to palm, hand and elbow	Laceration at base of right 2 nd finger (2 years earlier)	Student (skipping)	Onset after several hours of vigorous skipping at site of laceration (resolved after resection)	Case following a definite remote local trauma (not occupational)
Brynildsen, 1985 (18)	20	33/F	Right 4 th finger: large pacinian corpuscles surrounding and involving both digital nerves ^a	Numbness in metacarpophalangeal zone of finger	Laceration across the volar metacarpophalangeal joint of right 4 th finger (3 months earlier)	N/A	Resolved after resection	Case following a definite recent local trauma
Fletcher & Theaker, 1989 (19)	21	33/F	Right thumb, tip: unencapsulated bundles of large pacinian corpuscles ^a	Progressive enlargement of pulp of both thumbs (larger on right) since birth. Increasing pain in right thumb	No	N/A	Apparently congenital. Left-/right-handedness not reported (resolved after resection)	Unclear
	22	44/F	Right 2 nd finger: unencapsulated bundles of large pacinian corpuscles involving medial digital nerve ^a	Intense pain in finger, radiating to wrist and elbow	Crushing injury of distal phalanx of right 2 nd finger (3 months earlier)	N/A	Resolved after resection	Case following a definite recent local trauma
	23	54/M	Left hand, web space of amputated 4 th finger: unencapsulated bundles of large pacinian corpuscles	Very painful nodule adjacent to amputation	Traumatic amputation of left 4 th finger (timing unknown)	N/A	Outcome unknown	Case following a definite local trauma (timing unknown)
De Kaminsky et al, 1989 (20)	24	17/M	Right 2 nd finger, pulp: irregular cluster of pacinian corpuscles ^a	Pulp enlarged since 7 years of age; non-symptomatic	N/A	Student ^b	Childhood onset. Right handed ^b (outcome unknown)	Unclear
	25	24/M	Right 2 nd finger, pulp: proliferation of pacinian corpuscles	Progressive enlargement of nodule since 8 years of age; non-symptomatic	N/A	Student ^b	Childhood onset. Right handed ^b (outcome unknown)	Unclear
	26	37/F	Right 3 rd finger, 2 nd phalanx, palmar aspect: proliferation of pacinian corpuscles ^a	Painless nodule since 17 years of age; restricted movement	N/A	Construction worker ^b	Right handed ^b (outcome unknown)	Unclear

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Table 1. Continued.

Reference	Case	Age at diagnosis/ gender	Localization and histology	Signs and symptoms	History of trauma of the hand (temporality)	Occupational history (sports/hobbies)	Other pertinent information (treatment outcome)	Summary
Jones & Eadie, 1991 (21)	27	55/F	Multiple pacinian corpuscles adjacent to ulnar digital nerve of 2 nd finger and radial digital nerve of 3 rd finger	Pain on left palm and restricted flexion of 2 nd finger	Local trauma that may have been caused by several steroid injections (certainly after onset of restricted finger flexion)	N/A	Undisplaced fracture of left elbow 2 years before diagnosis followed by transient inability to flex 2 nd finger leaving pain/tenderness after spontaneous resolution (resolved after resection)	Unclear
Kojima et al, 1992 (22); Kojima et al, 1977 (10)	28	50/F	Palmar aspect of right 4 th metacarpus	Persistent intense pain since fracture	Fracture of right fourth metacarpus (20 years before diagnosis)	Cook	Comorbidity: glomus tumour in 5 th finger of ipsilateral hand (eventually resolved after 3 consecutive resections of recurring pacinian neuroma)	Case following a definite remote local trauma
MacPherson & Roy, 1992 (23)	29	59/M	Clusters of pacinian corpuscles (total, 13 × 10 × 6 mm) eroding distal ulnar aspect of proximal phalanx of left 2 nd finger	Painful nodule on proximal ulnar border of finger	No	N/A	Resolved after resection	Unclear
Dobyns, 1992 (24)	30	28/F	Pacinian neuroma (10 mm) at tip of left 4 th finger exactly where the finger tip meets the string	Expanding painful mass on violinist's fingering hand	Repetitive micro-trauma related to ~6 hour/day violin practice for ~20 years	Leading violinist of symphony orchestra	Partially resolved after resection; numbness and callus; continued career in teaching capacity	Case following definite local repetitive microtrauma at work
Bas et al, 1993 (25)	31	47/F	Rice-like nodule containing hypertrophic pacinian corpuscle (4 mm) attached to digital nerve of right 5 th finger ^a	8 years of intense pain radiating from finger to hand and arm	No	Housewife	Patient requested finger amputation because of unbearable pain and failed medical treatments (resolved after resection)	Unclear
Fraitag et al, 1994 (26)	32	70/M	Large grape-like cluster of rice-grain sized pacinian corpuscles extending from ulnar aspect of proximal phalanx of right 3 rd finger	Hemihypoesthesia of finger (presumably due to pacinian neuroma)	No	Locksmith	Incidental finding during urgent treatment for a lacerating wound. Right-handed.	Unclear
Reznik et al, 1998 (27)	33	63/F	Large pacinian corpuscles (up to 2.5 mm) along fourth collateral nerve of right 3 rd finger ^a	Progressive tenderness and pain during prehension of hand	No	Housewife	Resolved after resection	Unclear
	34	44/M	Large pacinian corpuscles (up to 2.5 mm) in side of right 3 rd finger that had been submitted to arthrodesis	Progressive pain on side of right 3 rd finger	Crushing injury, presumably at work, of right hand requiring amputation of 2 nd finger and arthrodesis of long finger (11 months before onset)	Skilled manual worker	Setting of trauma apparently occupational (resolved after resection)	Case following a definite recent local trauma (presumably occupational)
Rinaldi et al, 2000 (28)	35	62/M	Encapsulated cluster of pacinian corpuscles (7 × 2 mm) in distal phalanx of right thumb	Painful nodule	Thorn lesions in right thumb 2 months earlier	N/A (vegetable gardening) ^b	Pain persisted after spontaneous expulsion of thorn 20 days before surgery (resolved after resection)	Case following a definite very recent local trauma (presumably not occupational)

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Table 1. Continued.

Reference	Case	Age at diagnosis/ gender	Localization and histology	Signs and symptoms	History of trauma of the hand (temporality)	Occupational history (sports/hobbies)	Other pertinent information (treatment outcome)	Summary
Imai et al, 2003 (29)	36	67/M	Grape-like cluster of pacinian corpuscles attached to ulnar digital nerve of right 4 th finger	Pain and numbness on ulnar aspect of tip of right 4 th finger aggravated by heat or cold	Crushing injury of fingertip to right 4 th finger (6 months before onset)	N/A	Resolved after resection	Case following a definite recent local trauma
Vaes and De Smet, 2003 (30)	37	33/F	Pacinian corpuscle embedded in digital nerve at base of left 2 nd finger	Painful nodule	No	N/A	Comorbidity: ganglion of flexor tendon sheath at base of left thumb (resolved after resection)	Unclear
Kumar et al, 2003 (31)	38	32/M	Multinodular mass (8 × 3 × 2 mm) attached to branching digital nerve of left 5 th finger ^a	Spontaneous onset of sharp, incapacitating pain along radial border of finger pulp	No	N/A	Resolved after resection	Unclear
Kuruwila et al, 2003 (32)	39	17/F	Increased number of pacinian corpuscles of various sizes in first web space of right hand	Increasing pain since injury	Trap door injury involving wrist, thumb and 2 nd finger of the right hand (7 years earlier)	N/A	Resolved after resection	Case following a definite remote local trauma
Kenmochi et al, 2006 (33)	40	57/F	Large pacinian corpuscle surrounded by numerous small corpuscles associated with proliferation of nerve fibres in right 3 rd fingertip	“Severe tenderness” for 8 months	Puncture by a needle of right 3 rd finger tip (2 months before onset)	N/A	Outcome not reported	Case following a definite very recent local trauma
Yan et al, 2006 (34)	41	24/F	~12 hypertrophic pacinian corpuscles (up to 3.5 mm) in proximal phalanx of left 4 th finger	Painful swelling of proximal phalanx of left 4 th finger and increasing loss of sensation with tingling and numbness	N/A	N/A	Lifelong history of neurofibromatosis type 1 (resolved after resection)	Unclear
Vijayaraghavan et al, 2008 (35)	42	45/F	Nerve bundles and mature pacinian corpuscles of varying sizes in nodule on flexor tendon sheath in proximal phalanx of right 2 nd finger	Increasingly painful swelling over the volar surface of the right 2 nd finger, aggravated by flexion	Dog bite on the proximal phalanx of the right 2 nd finger (~18 months earlier)	N/A	Resolved after resection	Case following a definite recent local trauma
Yenidunya et al, 2008 (36)	43	55/F	Near digital nerve in proximal phalanx of right 2 nd finger	Pain and inability to extend right index, middle and 4 th fingers	Type 2A burn contracture from touching hot stove	N/A	Resolved after resection	Case following a definite remote local trauma
Present report	44	38/M	~12 large pacinian corpuscles around nerve endings at the interphalangeal joint of right thumb	Painful nodule and swelling on right thumb	Repetitive penetrating injuries by splinters in right thumb in an occupational setting (for 19 years before onset)	Orthopaedic technician	Coexposure to solvents (partially resolved after resection)	Case following definite local repetitive microtrauma at work

^a Surgical findings

^b Information derived from authors' personal communications.