

Dear Editor,

Lacertus syndrome: one term – two different pathologies

In 1959, George E. Bennett was the first to document a previously undescribed condition, which he had been observing in baseball pitchers (Bennett, 1959). He noticed that the players were doing repetitive throwing motions and at some point these led to pain and swelling at the medial elbow, which forced the athletes to end training prematurely. It was later found that these symptoms are caused by the compression of the hypertrophied pronator teres under the lacertus fibrosus (bicipital aponeurosis) (Jordan, 2020). In his work, Bennett restricted himself only to the description of this pathology, without assigning any specific term to it. Jordan (2020) suggested the term 'lacertus syndrome' in order to distinguish this disease from the more common pronator syndrome.

In actual fact, the term 'lacertus fibrosus bisipitis syndrome' was already used in 1983 to describe two clinical observations of acute proximal nerve compression at the level of the lacertus fibrosus (Gessini et al., 1983). A decade later, the term 'acute lacertus syndrome' was also mentioned to characterize complete or partial paralysis of the muscles innervated by the median nerve due to acute compression at the level of the lacertus fibrosus (Bassett et al., 1994).

More recently, Hagert (2013) termed dynamic median nerve compression at the level of the lacertus fibrosus 'lacertus tunnel syndrome'. After some time, this term was shortened to 'lacertus syndrome' (Hagert and Lalonde, 2016). Lacertus syndrome, as described by Hagert, is characterized by a decrease of strength in those muscles, innervated by a median nerve, as evident by worsening of fine motor skills in the hand and a sense of clumsiness (e.g. dropping objects). Pain was observed in the later stages of disease. This symptomatology is thought caused by repetitive median nerve compression at the level of the so-called lacertus tunnel.

There remains some confusion regarding the terminology of these conditions, where one term is potentially understood as two different pathologies.

Mehl et al. (2021) described 'lacertus syndrome' as compression of the pronator teres; whereas Tang (2021) refers to compression of the median nerve compression while using the same term. Löppönen et al. (2022) in their article on proximal median nerve compression, mentioned that lacertus syndrome had originally been described by Bennett in 1959, but in the next sentence he pointed out that this pathology has been popularized by the work of Hagert and Lalonde (2016).

Based on the fact that Bennett (1959) had not assigned a specific name to the pathology, and that 'the acute' condition of proximal median nerve compression remains extremely rare, we recommend that the term 'lacertus syndrome' to refer to intermittent median nerve compression at the level of the lacertus fibrosus. In our opinion, the pathology presented by Bennett (1959) should be called chronic exertional compartment syndrome of the pronator teres, analogously to the isolated compartment syndrome of other muscles of the forearm (Scheibler and Schweizer, 2021). Otherwise it could be called 'Bennett's syndrome' in honour of the author who first described this pathology. Table 1 presents the summary of the main characteristics of each of these two pathologies.

In terms of pathophysiology, it is safe to assume that compression by the lacertus fibrosus lies in the basis of both conditions. In addition, a surgical technique called 'lacertus release' can be used for the treatment of both conditions. Hagert (2013) suggests performing this release from a transverse incision placed in the flexion crease of the cubital fossa, while Jordan (2020) proposed a more classical longitudinal approach in the forearm.

It is interesting that both Hagert (2013) and Jordan (2020) used the term 'lacertus syndrome' in order to differentiate the pathology from pronator syndrome. It is now believed that pronator syndrome is a collective concept that describes median nerve compression at a number of sites, from the lower third of the shoulder to the middle third of the forearm, including the level of the lacertus tunnel (Tang, 2021). Both Hagert (2013) and Jordan (2020) agree that a careful history and a complete physical

Table 1. Summary of differences between lacertus syndrome and chronic exertional compartment syndrome of the pronator teres.

	Lacertus syndrome	Chronic exertional compartment syndrome of the pronator teres
Author, year of first description	Gessini L et al., 1983; Hagert E, 2013	Bennett, 1959; Jordan, 2020
Aetiology	Dynamic compression of the median nerve by the lacertus fibrosus	Compression of the pronator teres by the lacertus fibrosus
Signs and symptoms	Decrease of strength in the fist and pinch grip, worsening of fine motor skills, pain in advanced case of pathology	Pain and swelling at the medial elbow after continuous throwing activity
Diagnosis	Clinical examination (classic triad: pain over the point of compression (lacertus level), weakness when manually testing the strength of the muscles innervated by the median nerve distal to the lacertus fibrosus, especially the FPL, FDP II and FCR, positive scratch-collapse test)	Specific history, examination after provoking exercise, MRI scans
Treatment	Non-operative: local triamcinolone injections at the edge of the lacertus fibrosus. Operative: lacertus release	Non-operative: modification of activity, avoidance of provoking actions. Operative: lacertus release

FPL: flexor pollicis longus; FDP II: flexor digitorum profundus index; FCR: flexor carpi radialis.

examination are required in order to make the correct diagnosis.

To date, there remains real no consensus among hand surgeons with regards to the description and name of these discussed pathological conditions in the area of the elbow, humerus and forearm. Solving the problem of ambiguity in terminology will be useful for both researchers and clinicians.

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References

- Bassett FH 3rd, Spinner RJ, Schroeter TA. Brachial artery compression by the lacertus fibrosus. *Clin Orthop Relat Res.* 1994, 307: 110–6.
- Bennett GE. Elbow and shoulder lesions of baseball players. *Am J Surg.* 1959, 98: 484–92.
- Gessini L, Jandolo B, Pietrangeli A. Entrapment neuropathies of the median nerve at and above the elbow. *Surg Neurol.* 1983, 19: 112–6.

- Hagert E. Clinical diagnosis and wide-awake surgical treatment of proximal median nerve entrapment at the elbow: a prospective study. *Hand (NY).* 2013, 8: 41–6.
- Hagert E, Lalonde DH. Lacertus syndrome: median nerve release et the elbow. In: D Lalonde (Ed.) *Wide awake hand surgery.* Thieme Publishing, 2016: 141.
- Jordan SE. The lacertus syndrome of the elbow in throwing athletes. *Clin Sports Med.* 2020, 39: 589–96.
- Löppönen P, Hulkkonen S, Ryhänen J. Proximal median nerve compression in the differential diagnosis of carpal tunnel syndrome. *J Clin Med.* 2022, 11: 3988.
- Mehl A, Stevenson J, Royal JT, Lourie GM. Lacertus syndrome: use of pre- and post-exercise MRI to aid in diagnosis and treatment. *Radiol Case Rep.* 2021, 16: 1113–7.
- Scheibler AG, Schweizer A. Isolated chronic exertional compartment syndrome of the flexor carpi radialis: a case report. *Orthop J Sports Med.* 2021, 9: 23259671211035455.
- Tang JB. Median nerve compression: lacertus syndrome versus superficialis-pronator syndrome. *J Hand Surg Eur.* 2021, 46: 1017–22.

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