ARTICOLO ORIGINALE

Rivista Italiana di CHIRURGIA della MANO
2025;62:1-50
https://doi.org/10.53239/2784-9651-2025-10

Clinical Test for de Quervain's Disease

Test clinico per la malattia di De Quervain

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Summary

Background. The purpose of this study is to describe a new clinical test for de Quervain's disease and to compare it with the Eichhoff's and Finkelstein's tests.

Materials and methods. The suggested test is performed in the following way. The patient is asked to place his/her palm on the table and relax the hand, especially the thumb. After that the examiner applies resistance to the radial surface of the proximal interphalangeal joint of the extended index finger, and the patient actively abducts this finger. The test is considered to be positive if the patient feels mild pain or discomfort at the radial styloid process. This clinical test is based on the principle of muscle synergism. Forty three patients (27 right and 20 left hands) were evaluated. All of them had clinical signs of de Quervain's disease. There were 36 women and 7 men. The mean age was 50 years (range, 28-70 years). Forty three persons (27 right and 20 left hands) were included in the control group. The participants in the experimental and control groups were matched by gender and age. All control persons had no trauma, no acute or chronic disease of their hands and no clinical signs of de Quervain's disease.

Results. The sensitivity of the tests was: Eichhoff's test -0.851; Finkelstein's test -0.851; new test -0.915. The specificity was: Eichhoff's test -0.915; Finkelstein's test - 0.957; new test - 0.957. The positive predictive value was: Eichhoff's Test -0.909; Finkelstein's test -0.925; the new test -0.955. The negative predictive value was: Eichhoff's test -0.860; Finkelstein's test -0.865; the new test -0.918.

Conclusions. The suggested new test can be used in the diagnosis of de Quervain's disease.

Key words: de Quervain's disease, diagnosis, new clinical test, retrospective, case-control study

Levels of Evidence: IV

Riassunto

Introduzione. *Lo scopo di questo studio è descrivere un nuovo test clinico per la malattia di de Quervain e confrontarlo con i test di Eichhoff e Finkelstein.*

Materiali e metodi. *Il test proposto viene eseguito nel modo seguente. Al paziente viene chiesto di appoggiare il palmo della mano sul tavolo e di rilassare la mano, soprattutto il pollice. Successivamente, l'esaminatore applica una resistenza alla superficie radiale dell'articolazione interfalangea prossimale dell'indice esteso e il paziente abduce attivamente questo dito. Il test è considerato positivo se il paziente*

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Conflitto di interessi
Gli Autori dichiarano di non avere alcun conflitto di interesse con l'argomento trattato nell'articolo.

Come citare questo articolo: Goloborod'ko SA. Clinical Test for de Quervain's Disease. Rivista Italiana di Chirurgia della Mano 2025;62:1-50. https://doi.org/10.53239/2784-9651-2025-10

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avverte un lieve dolore o fastidio in corrispondenza del processo stiloideo radiale. Questo test clinico si basa sul principio del sinergismo muscolare. Sono stati valutati quarantatré pazienti (27 mani destre e 20 mani sinistre). Tutti presentavano segni clinici della malattia di de Quervain. Erano 36 donne e 7 uomini. L'età media era di 50 anni (range, 28-70 anni). Quarantatre persone (27 mani destre e 20 mani sinistre) sono state incluse nel gruppo di controllo. I partecipanti ai gruppi sperimentali e di controllo sono stati abbinati per sesso ed età. Tutte le persone di controllo non avevano traumi, né malattie acute o croniche alle mani, né segni clinici della malattia di de Quervain.

Risultati. *La sensibilità dei test è stata: Test di Eichhoff -0,851; Test di Finkelstein -0,851; nuovo test -0,915. La specificità era: Test di Eichhoff -0,915; test di Finkelstein -0,957; nuovo test -0,957. Il valore predittivo positivo era: Test di Eichhoff -0,909; test di Finkelstein -0,925; nuovo test -0,955. Il valore predittivo negativo era: Test di Eichhoff -0,860; Test di Finkelstein -0,865; il nuovo test -0,918.*

Conclusioni. *Il nuovo test proposto può essere utilizzato per la diagnosi della malattia di de Quervain.*

Parole chiave: *malattia di de Quervain, diagnosi, nuovo test clinico, retrospettivo, caso-controllo studio.*

Livelli di evidenza: IV

Introduction

A few clinical tests are used for the diagnosis of de Quervain's disease. Advantages and disadvantages of these manoeuvres are well-known [1].

Kutsumi et al. [2] "suggest that de Quervain's disease may be primarily a problem of the EPB rather of the APL, or of the EPB and APL equally." Therefore for the diagnosis of de Quervain's disease I suggest using the method, which was described for testing of the extensor pollicis brevis (EPB) [3].

The purpose of this study is to describe a new clinical test for de Quervain's disease and to compare it with Eichhoff's and Finkelstein's tests.

Materials and methods

Experimental Group

Forty three patients (27 right and 20 left hands) were evaluated (Tab. I). All of them had clinical signs of de Quervain's disease: local tenderness on the postero-lateral aspect of the radial styloid process, pain with abduction and flexion of the thumb worse with wrist ulnar deviation, swelling etc. There were 36 women and 7 men. The mean age was 50 years (range, 28-70 years). Twenty eight patients (30 hands) underwent surgery and had resolution of symptoms after the release of the first extensor fibroosseous tunnel (patients 1-28 in Tab. I).

Table I. Tests in the Experimental Group.

Case No.	Gender/ Age (yr)	Hand	Eichhof's Test	Finkelstein's Test	New Test
1	F/52	Right	+	+	+
		Left	+	+	+
2	F/55	Right	+	+	+
		Left	-	-	+
3	F/46	Left	+	+	+
4	F/53	Right	+	+	+
5	F/32	Right	+	+	+
6	F/47	Left	+	+	+
7	F/42	Right	+	+	+
8	F/57	Right	+	+	+
9	F/42	Left	+	+	+

Table I. (*Follows from the previous page*).

Case No.	Gender/ Age (yr)	Hand	Eichhof's Test	Finkelstein's Test	New Test
10	F/70	Right	+	+	+
11	F/48	Right	+	+	-
12	F/62	Left	-	-	+
13	F/55	Right	+	+	+
14	F/68	Right	-	-	+
15	F/55	Right	+	+	+
16	M/35	Left	+	+	-
17	M/61	Right	+	+	+
18	M/59	Right	+	+	+
19	F/54	Left	+	+	+
20	F/62	Left	+	+	-
21	F/58	Left	+	+	+
22	F/56	Right	+	+	+
23	F/51	Right	+	+	+
24	M/47	Left	-	-	+
25	F/49	Left	+	+	+
26	F/54	Right	+	+	+
27	F/70	Left	+	-	+
28	F/50	Right	-	+	+
29	F/53	Right	+	+	+
30	M/56	Right	+	+	+
31	F/37	Left	+	+	+
32	F/36	Right	-	-	+
33	F/61	Right	+	+	+
34	F/67	Left	+	+	+
35	F/47	Right	+	+	+
36	F/50	Right	+	+	+
37	M/53	Right	+	+	+
38	F/54	Right	+	+	+
39	F/51	Left	+	+	+
40	F/54	Left	+	+	+
41	M/39	Left	+	+	+
42	F/28	Right Left	+ +	+ +	+ +
43	F/29	Right Left	- +	- +	- +

F = female; M = male; + = positive test; - = negative test.

Control Group

Forty three persons (27 right and 20 left hands) were included in the control group. The participants in experimental and control groups were matched by gender and age (Tab. II). 17 control individuals were hospital staff and 26 persons were patients of the same hospital with orthopedic problems of lower extremities. All control persons had no trauma, no acute or chronic diseases of their hands and no clinical signs of de Quervain's disease.

Residents of the hospital helped to test patients and individuals in both the experimental and control groups in random order. Eichhoff's, Finkelstein's, and the proposed tests were performed 2-3 minutes apart. All hospital residents and participants in the experimental and control groups were not fa-

Table II. Tests in the Control Group.

Case No.	Gender/ Age (yr)	Hand	Eichhof's Test	Finkelstein's Test	New Test
1	F/56	Right	+	-	+
2	F/51	Left	-	-	-
3	F/54	Left	-	-	-
4	M/39	Left	-	-	-
5	F/46	Left	-	-	-
6	F/53	Right	-	-	-
7	F/32	Right	+	+	-
8	F/47	Left	-	-	-
9	F/42	Right	-	-	-
10	F/57	Right	-	-	-
11	F/42	Left	-	-	-
12	F/70	Right	+	+	-
13	F/48	Right	-	-	-
14	F/62	Left	-	-	-
15	F/55	Right	-	-	-
16	F/68	Right	-	-	-
17	F/55	Right	-	-	-
18	M/35	Left	+	-	+
19	M/61	Right	-	-	-
20	M/59	Right	-	-	-
21	F/54	Left	-	-	-
22	F/62	Left	-	-	-
23	F/58	Left	-	-	-
24	F/51	Right	-	-	-
25	M/47	Left	-	-	-
26	F/49	Left	-	-	-
27	F/54	Right	-	-	-
28	F/70	Left	-	-	-
29	F/50	Right	-	-	-
30	F/53	Right	-	-	-
31	M/56	Right	-	-	-

Table II. (*Follows from the previous page*)

Case No.	Gender/ Age (yr)	Hand	Eichhof's Test	Finkelstein's Test	New Test
32	F/37	Left	-	-	-
33	F/36	Right	-	-	-
34	F/61	Right	-	-	-
35	F/67	Left	-	-	-
36	F/47	Right	-	-	-
37	F/50	Right	-	-	-
38	M/53	Right	-	-	-
39	F/54	Right	-	-	-
40	F/29	Right Left	- -	- -	- -
41	F/28	Right Left	- -	- -	- -
42	F/52	Right Left	- -	- -	- -
43	F/55	Right Left	- -	- -	- -

F = female; M = male; + = positive test; - = negative test.

miliar with the hypothesis, diagnosis, or tests. The residents did not know if the persons were from the experimental or control groups.
All operations and analysis of results were performed by the same experienced orthopedic traumatologist.
Informed consent was obtained, and the rights of the humans were protected in all participants from the experimental and control groups.
Bioethics Commission of the Hospital approved this retrospective case-control study (04.01.2022, No 25).

Technique
The suggested test is performed in the following way. The patient is asked to place his/her palm on the table and relax the hand, especially the thumb. After that the examiner applies resistance to the radial surface of the proximal interphalangeal joint of the extended index finger, and the patient actively abducts this finger (Fig. 1). The test is considered to be positive if the patient feels mild pain or discomfort at the radial styloid process.

Figure 1. New clinical test for de Quervain's disease.

Results
In the experimental group the result of new test was positive in 39 patients (43 hands) and in the control group in two persons (2 hands). Sensitivity of the suggested test was 0.915, of Eichhoff's test -0.851 and of Finkelstein's test -0.851. Spec-

Table III. Test Results.

	Eichhoff's Test	Finkelstein's Test	New Test
Sensitivity	0.851	0.851	0.915
Specificity	0.915	0.957	0.957
Positive Predictive Value	0.909	0.925	0.955
Negative Predictive Value	0.860	0.865	0.918
Positive Likelihood Ratio	10.012	19.791	21.279
Negative Likelihood Ratio	0.163	0.156	0.089

ificity of new test was 0.957, of Finkelstein's test -0.957 and of Eichhoff's test -0.915. The results of the sensitivity, specificity, the positive and negative predictive value, the positive and negative likelihood ratio of Eichhoff's, Finkelstein's, new tests are summarized in Table III.

Discussion

Abductor pollicis longus and EPB tendons entrapment of the first dorsal compartment was described in 1892 by Tillaux [4], in the 1893 edition of Gray's Anatomy [5] and in 1895 by de Quervain [1]. The diagnosis is based on the characteristic complaints, clinical picture, and provocative tests such as Eichhoff's, Finkelstein's, Brunelli's, and WHAT tests [1].

I described new clinical test for de Quervain's disease and compared it with most popular Eichhoff's and Finkelstein's tests. It was found empirically that during this new test the EPB is strained [3]. Author of this test assumed, that mechanism of the test can be explained by the theory that was described by Matev and Bankov [6]. According to their theory, there are motor muscles, neutralizer muscles and stabilizer muscles. Movements in the joints of the hand are carried out with the participation of all three muscle groups.

Between stabilizer and motor muscles there are expressed reflex connections, so when motor muscle contracts during a certain movement, the stabilizer muscle always contracts isometrically and involuntarily. This is so-called the principle of muscle synergism [7]. In the suggested test the first dorsal interosseous muscle is a motor muscle, and the EPB is a stabilizer muscle, therefore it is strained [3]. The examiner can see and palpate this strained EPB.

Eichhoff's, Finkelstein's, Brunelli's manoeuvres have disadvantages: severe pain and discomfort even in healthy people, in patients with arthritis of the first carpometacarpal and wrist joints, as well as Wartenberg and intersection syndromes; pain from the stretch of the radial collateral, the scaphotrapezial or the thumb carpometacarpal ligaments [1,8]. In addition, in some patients extremely painful extension contracture of the thumb may be observed, and therefore it is impossible to carry out all phases of Eichhoff's and Finkelstein's tests in full, i.e. simultaneous passive flexion of the thumb and wrist ulnar deviation. In the new test the strained EPB is in contact only with the thickened first extensor compartment pulley, as in Brunelli's test, but in the suggested test the excursion of the EPB and movements in the joints practically absent, so new clinical test is deprived of the disadvantages inherent in most popular Eichhoff's,
Finkelstein's, Brunelli's manoeuvres.

Results of this study confirm the rather high efficiency of the suggested test. Sensitivity of new test (0.915) was better, than of Eichhoff's and Finkelstein's tests. Specificity of new test (0.957) was similar to specificity of Finkelstein's and better, than of Eichhoff's tests.

The study has limitations. As other above mentioned clinical provocative tests, this new test is subjective. There is no standard of force that the examiner applies to the radial surface of the index finger. It is difficult to determine when the patient begins to feel pain or discomfort, as the patient's response may depend on even from compliance between the patient and the examiner.

A relatively small sample was included in this case-control study.

This work has disadvantages as any case-control study [9]. And I completely agree with the authors [9] who conclude, that case-control studies "are however useful for generating hypotheses. These hypotheses can then be tested more rigorously by other methods — randomized controlled trials or cohort studies."

Conclusion

Thus the suggested new test can be used successfully in the diagnosis of de Quervain's disease.

Acknowledgments

The author thanks the residents of the Regional Clinical Traumatological Hospital (Kharkov, Ukraine) for their assistance with clinical studies of the persons in both the experimental and control groups.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Ethical approval

All procedures were in accordance with ethical standards of the Bioethics Comission of the Regional Clinical Traumatological Hospital (04.01.2022, #25) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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