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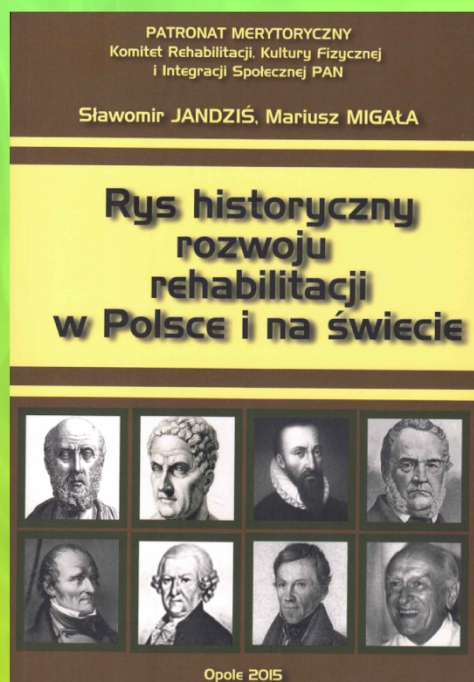
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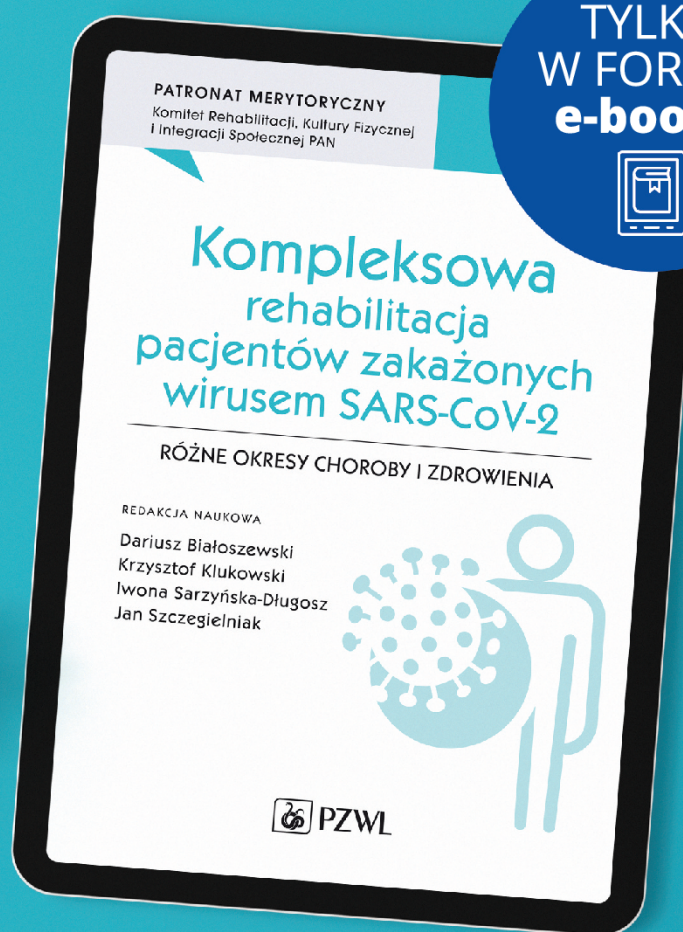
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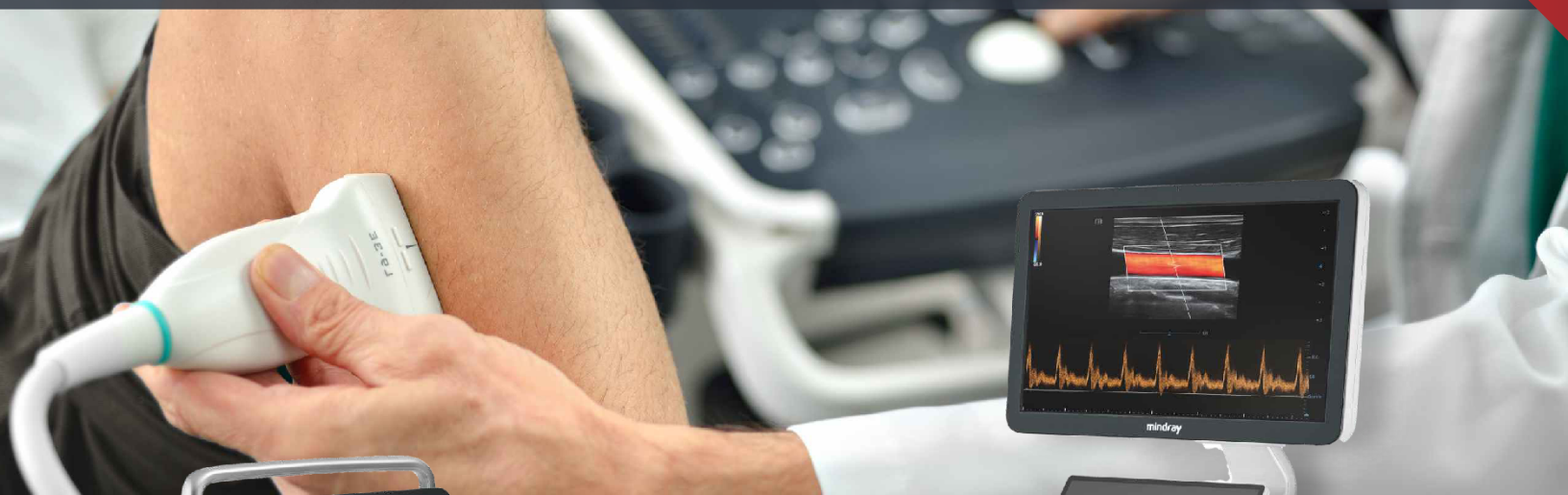


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18 March 2023 - 30 May 2023	1 June 2023 - 20 July 2023	1 - 20 July 2023	20 July 2023 - 2 August 2023	27 July 2023 - 2 August 2023	5 August 2023	September - December 2023
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26. Sympozjum Sekcji Rehabilitacji Kardiologicznej i Fizjologii Wysiłku Polskiego Towarzystwa Kardiologicznego

11-13 maja 2023, Wisła, Hotel STOK

www.rehabilitacja2023ptk.pl



Rehabilitacja kardiologiczna i fizjologia wysiłku – zapraszamy do rejestracji na wyjątkową konferencję w Wiśle

W dniach 11–13 maja w Hotelu Stok Wiśle odbędzie się wyjątkowe i interdyscyplinarne spotkanie specjalistów z całej Polski – 26. Sympozjum Sekcji Rehabilitacji Kardiologicznej i Fizjologii Wysiłku Polskiego Towarzystwa Kardiologicznego. Serdecznie zapraszamy do rejestracji.

26. Sympozjum Sekcji Rehabilitacji Kardiologicznej i Fizjologii Wysiłku Polskiego Towarzystwa Kardiologicznego to coroczne spotkanie specjalistów, zajmujących się rehabilitacją kardiologiczną, prewencją chorób układu krążenia i innymi formami aktywności fizycznej, która ma prowadzić do poprawy stanu naszego zdrowia.

Ta trzydniowa konferencja przeznaczona jest dla lekarzy kardiologów, specjalistów rehabilitacji medycznej oraz innych specjalności, którzy w swojej codziennej praktyce zajmują się rehabilitacją i fizjologią wysiłku, ale także dla fizjoterapeutów, pielęgniarek, techników i przedstawicieli innych zawodów medycznych, zainteresowanych tematyką spotkania, oraz studentów.

Jakie tematy zostaną poruszone podczas konferencji?

26. Sympozjum Sekcji Rehabilitacji Kardiologicznej i Fizjologii Wysiłku to konferencja, na którą zaproszeni zostali wybitni specjaliści z dziedziny kardiologii i nie tylko. Podczas wydarzenia wygłoszonych zostanie prawie 100 wykładów merytorycznych w ciągu aż 20 sesji. Uczestnicy będą mieli również szansę na udział w sesjach przypadków klinicznych, intensywnych warsztatach, a także panelach dyskusyjnych. To wydarzenie cechujące się dużą interdyscyplinarnością, dlatego z pewnością każdy znajdzie coś dla siebie.

Podczas wydarzenia kompleksowo pochylimy się nad dziedziną rehabilitacji kardiologicznej i fizjologii wysiłku. Wśród tematów wiodących znajdują się:

- rehabilitacja w dobie pandemii i po pandemii COVID-19;
- telerehabilitacja i rehabilitacja hybrydowa;
- rehabilitacja kardiologiczna w specyficznych grupach pacjentów;
- programy KOS-zawał i KONS;
- nowe standardy ESC, PTK i SRKiFW;
- Testy wysiłkowe i testy spiroergometryczne
- monitorowanie wysiłku fizycznego;
- prewencja pierwotna i wtórna chorób sercowo-naczyniowych;
- farmakoterapia pacjentów rehabilitowanych kardiologicznie i nie tylko;
- sport i aktywność sportowa w kardiologii;
- czynniki ryzyka chorób układu krążenia.

Program merytoryczny wydarzenia jest niezwykle bogaty i angażujący. Warto podkreślić także, iż na konferencji pojawią się specjalne sesje wykładów prowadzone przez zaproszone sekcje i ассоjacje Polskiego Towarzystwa Kardiologicznego, m.in. Sekcję Kardiologii Sportowej, Ассоjację Niewydolności Serca, Ассоjację Elektrokardiologii Nieinwazyjnej i Telemedycyny, Sekcję Pielęgniarstwa Kardiologicznego i Pokrewnych Zawodów Medycznych, „Klub 30”, Sekcję Farmakoterapii Sercowo-Naczyniowej, Sekcję Prewencji i Epidemiologii, a także Polskie Towarzystwo Medycyny Sportowej.

„Pandemia wymusiła na nas zmianę paradygmatu rehabilitacji kardiologicznej”

Organizatorami wydarzenia są wydawnictwo naukowe Evereth Publishing oraz Sekcja Rehabilitacji Kardiologicznej i Fizjologii Wysiłku Polskiego Towarzystwa Kardiologicznego (SRKiFW). Przewodniczącą Komitetu Naukowego jest prof. dr hab. n. med. Małgorzata Kurpesa, Wiceprzewodniczącymi – prof. dr hab. n. med. Anna Jagier, dr hab. n. med. Dominika Szałewska, a Komitetu Organizacyjnego – dr n. med. Bartosz Szafran.

Dr n. med. Agnieszka Mawlichanów, Przewodnicząca SRKiFW, podkreśla, iż ostatnie Sympozjum miało miejsce w 2019 r. w Wiśle. W tym czasie udało się zorganizować wydarzenie w formule online, jednak zdaniem Przewodniczącej obecnie „wszyscy spragnieni jesteśmy spotkania osobistego, wymiany doświadczeń i bezpośrednich rozmów, nie tylko na sali wykładowej, ale i w kulisach”.

– Cztery lata w sporcie to pełna olimpiada, a w naszej dziedzinie kardiologii można powiedzieć – cała wieczność. Pandemia wymusiła na nas zmianę paradygmatu rehabilitacji kardiologicznej, między innymi stworzyła pole dla rozwoju modelu hybrydowego i monitorowanego telemedycznie. W tym czasie ukazało się wiele ważnych dokumentów, stworzonych przez polskie i europejskie towarzystwa kardiologiczne, dotyczące rehabilitacji, prewencji i aktywności fizycznej. Dynamicznie w naszym kraju rozwija się też program KOS-zawał, przynoszący liczne korzyści, ale też budzący kontrowersje. O tym wszystkim i jeszcze wielu innych sprawach pragniemy podyskutować w czasie naszego majowego spotkania – zapowiedziała dr Mawlichanów.

Rejestracja na 26. Sympozjum Sekcji Rehabilitacji Kardiologicznej i Fizjologii Wysiłku możliwa jest na stronie internetowej konferencji rehabilitacja2023ptk.pl/rejestracja/. Informacje na temat opłatyjazdowej i wydarzeń towarzyszących znajdują się tutaj: rehabilitacja2023ptk.pl/oplata-konferencyjna/.

Informujemy jednocześnie, iż liczba miejsc na konferencji jest ograniczona, dlatego warto zarejestrować się już dzisiaj.

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Effect of radiofrequency in de Quervain's tenosynovitis: A randomized control trial

Wpływ radiofrekwencji na zapalenie pochewki ścięgna nadgarstka: randomizowane badanie kontrolowane

**Yomna F. Ahmed^{1(A,B,D,E,F)}, Sarah S. Abdelaziz^{2(A,C,D,F)}, Marian M. Fayed^{3(B,C,E,F)},
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Abstract

Background. De Quervain's tenosynovitis is mucoid degeneration of the tendon sheaths of the two tendons that regulate the mobility of the thumb. As a result, the wrist's thumb side is painful and uncomfortable.

Objectives. To assess radiofrequency's effectiveness in patients with de Quervain's tenosynovitis.

Design. A prospective randomized controlled trial. Setting. physical therapy department, Rail Way Hospital.

Methods. 40 participants with de Quervain's tenosynovitis. Participants were divided into two groups at random: group A (control group), which received an ultrasound, transverse friction massage, and strengthening exercises; and group B (study group), which received radiofrequency plus ultrasound, transverse friction massage, and strengthening exercises. Pain intensity, hand grip strength, and pinch strength were all measured at the baseline and after 4 weeks of treatment by using the visual analog scale, Jamar dynamometer, and pinch gauge, respectively.

Results. All outcome indicators in both groups improved statistically significantly ($P < 0.05$), according to within-group comparisons. The between-group comparisons showed significant improvement in all outcome measures for both groups ($P < 0.05$), with the study group showing superior improvement to the control group; the study group's VAS improvement percentage was 28.7%, its grip strength improvement percentage was 6.71%, and its pinch strength improvement percentage was 28.6%.

Conclusion. In comparison to ultrasound, transverse friction massage, and strengthen exercise, radiofrequency plus ultrasound, transverse friction massage, and strengthen exercise resulted in greater improvements in de Quervain's tenosynovitis patients' pain intensity, hand grip strength, and pinch strength.

Keywords

de Quervain's tenosynovitis, radiofrequency, pain severity, hand grip strength, and pinch strength

Streszczenie

Informacje wprowadzające. Zapalenie pochewki ścięgna nadgarstka to zwyrodnienie śluzowe pochewek ścięgniowych dwóch ścięgien, które regulują ruchomość kciuka. W rezultacie ból i dyskomfort odczuwane są po stronie kciuka w nadgarstku.

Cele. Ocena skuteczności stosowania radiofrekwencji u pacjentów z zapaleniem pochewki ścięgna nadgarstka.

Projekt. Prospektywne, randomizowane badanie kontrolowane. Miejsce. Oddział fizjoterapii Szpitala Kolejowego.

Metody. 40 uczestników z zapaleniem pochewki ścięgna nadgarstka. Uczestnicy zostali podzieleni losowo na dwie grupy: grupa A (grupa kontrolna), która była poddawana ultradźwiękom, masażowi poprzecznemu oraz wykonywała ćwiczenia wzmacniające; oraz grupa B (grupa badawcza), która była poddawana radiofrekwencji i ultradźwiękom, masażowi poprzecznemu i wykonywała ćwiczenia wzmacniające. Natężenie bólu, siłę chwytu dłoni i siłę szczypania mierzono na początku interwencji i po 4 tygodniach, odpowiednio za pomocą wizualnej skali analogowej, dynamometru Jamar i miernika szczypania.

Wyniki. Porównania wewnątrzgrupowe wykazały, że wszystkie wskaźniki wyników w obu grupach poprawiły się statystycznie istotnie ($P < 0,05$). Porównania między grupami wykazały znaczną poprawę we wszystkich miarach wyników dla obu grup ($P < 0,05$), przy czym grupa badawcza wykazała lepszą poprawę niż grupa kontrolna; procentowa poprawa VAS grupy badawczej wyniosła 28,7%, procentowa poprawa siły chwytu wyniosła 6,71%, a procentowa poprawa siły szczypania wyniosła 28,6%.

Wniosek. W porównaniu z ultradźwiękami, masażem poprzecznym i ćwiczeniami wzmacniającymi, radiofrekwencja i ultradźwięki, masaż poprzeczny i ćwiczenia wzmacniające skutkowały większą poprawą w zakresie redukcji intensywności bólu u pacjentów z zapaleniem pochewki ścięgna nadgarstka, w zakresie siły uścisku dłoni i siły szczypania.

Słowa kluczowe

zapalenie pochewki ścięgna nadgarstka, radiofrekwencja, nasilenie bólu, siła chwytu dłoni i siła szczypania

Introduction

Both laborers and athletes might get tenosynovitis in their hands and wrists. The most prevalent tenosynovitis of the hand and wrist is called De Quervain illness [1-2]. The extensor pollicis brevis and abductor pollicis longus tendons are affected by the painful, inflammatory disorder known as de Quervain's tenosynovitis. Its distinctive symptoms include pain on the wrist's radial side, tenderness spasms, intermittent burning in the hand, and swelling on the thumb side of the wrist [3]. The start is frequently gradual. It can result from acute trauma, biomechanical compression, the thumb's abduction, and extension, as well as from overuse and repetitive wrist movements in ulnar deviation. It may also be brought on by pregnancy or rheumatoid arthritis [4].

Surgery, corticosteroid injections, painkillers, thumb splints, physical therapy techniques are treatment available for De Quervain tenosynovitis [5-6]. Physical therapy like exercises for strengthening muscles, deep friction massage, ultrasound, cold therapy, moist heat therapy, and tendon gliding exercise [7].

Pulsed radiofrequency (PRF), a form of radiofrequency, is used as a physical treatment tool. By providing an electrical field and heat bursts to specific nerves or tissues without harming these structures, it has been demonstrated to be both safe and effective in relieving a variety of pain and muscle spasms [8, 9]. A brief electrical stimulation is used by PRF, followed by a lengthy period of rest. Consequently, PRF does not produce enough heat to harm structures [10]. Although the precise mechanism of PRF is unknown, there is speculation that the electrical field it generates can alter pain signals. [11, 12].

The effectiveness of Pulsed radiofrequency in treating pain has been demonstrated in numerous clinical studies for tre-

ating joint pain and spinal disorders pain [13, 14]. Up to author knowledge there is no studies on the use of pulsed radiofrequency in de Quervain's tenosynovitis have been done. Subsequently, it was suggested in the current academic research to assess PRF's effectiveness in patients with de Quervain's tenosynovitis.

Materials and methods

Participants

The study comprised 40 participants (5 men and 35 women) with de Quervain's tenosynovitis who had been diagnosed and referred by their orthopedics doctor from the orthopedics clinic of the railway hospital, the participants' ages ranged from 35 to 50 where included in the study. Less than three months duration of de quervain's tenosynovitis, wrist or carpometacarpal joint osteoarthritis, Subjects with uncontrolled diabetic mellitus, osteoporosis, entrapment neuropathy, past corticosteroid therapies for this illness, wrist or carpometacarpal joint injuries are excluded from the study [15].

Study design and randomization

A randomized, single-blinded, pre-posttest trial was used in this research from May 2022 to December 2022. An author who was not involved in the evaluation or therapy conducted the randomization technique. Permuted blocks of different sizes were adopted to randomly distribute the included participant into group A (control group) which was received ultrasound, transverse friction massage and strengthening exercises or group B (study group) which was received radiofrequency, ultrasound, transverse friction massage and strengthening exercises. The flowchart provided a summary of the recruitment procedure (Figure 1).

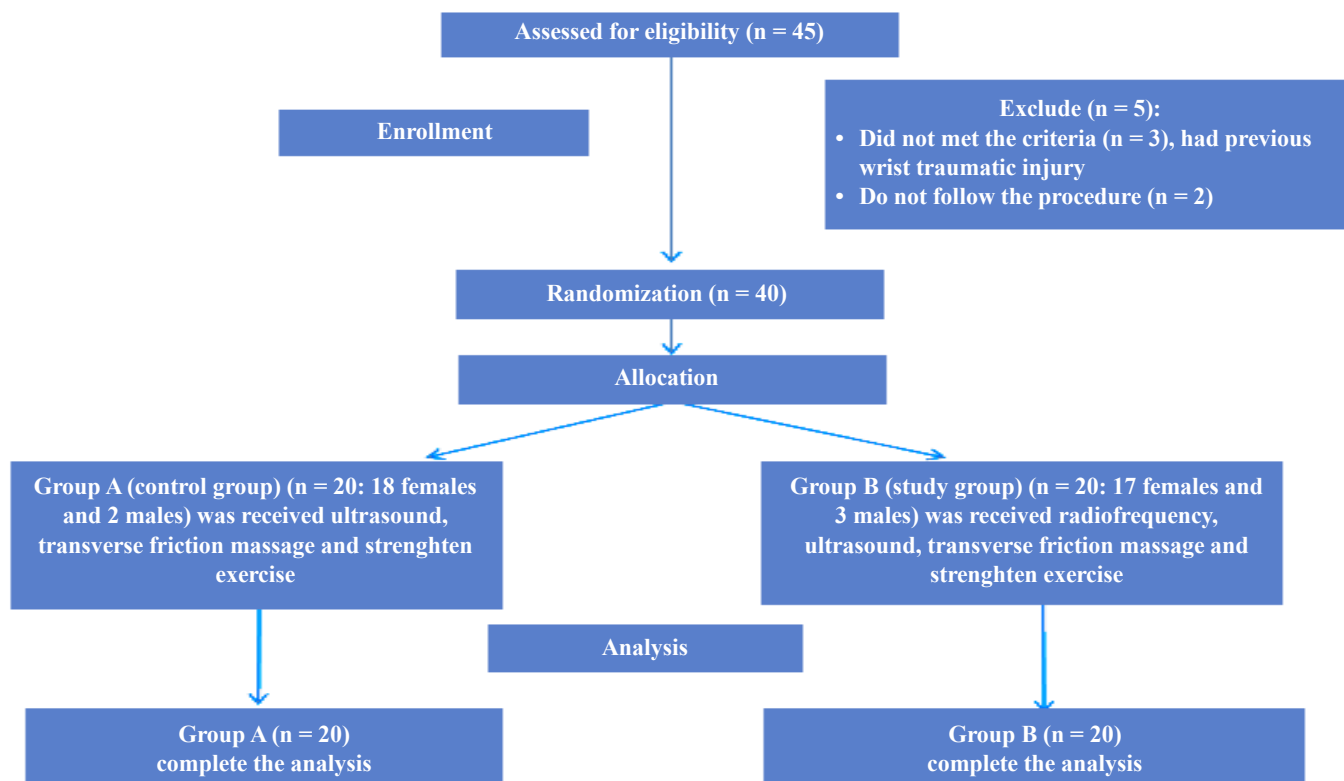


Figure 1. Flow chart for the study's participants

With approval number REC/2111/MTI.PT/2204064, the study has been approved by the research ethics committee of the faculty of physical therapy at the Modern University for Technology and Information in Egypt. Each participant acknowledged their agreement to participate and the publication of the results by signing two copies of the written consent form.

Procedures

The control group (A) involved 20 de Quervain's tenosynovitis participant who received ultrasound (Medserve, England NN114HE, Prosound / ULS-1000, S/N: U0547) with duration was 0.7 W/cm² for 5 minutes, 3 MHz [15, 16], transverse friction massage over the radial side of the wrist [6] and muscle strengthening exercise [6] that consist of:

1. Wrist flexion: the participant is asked to raise his or her wrist, hold a dumbbell in their hand with the palm facing up, slowly drop the weight, and then return to the beginning position. Three sets of ten repetitions are performed by the participant.
2. Wrist radial deviation strengthening: The participant holds a dumbbell and gently bends his or her wrist up, with the thumb pointing upward. Next, the participant places their wrist in a sideways posture with their thumb up. Return to the starting position gradually. Throughout the entire activity, the participant does not move his or her forearm. Three sets of ten repetitions are performed by the participant.

3. Wrist extension: the participant with the palm of his or her hand facing down, holding a dumbbell. His or her wrist should be raised slowly. Put the weight at the beginning position while gradually lowering it. The participant performs three sets of ten repetitions.

4. Grip strengthening: The participant is asked to squeeze a soft rubber ball for 5 seconds while maintaining the squeeze. The participant performs three sets of fifteen reps.

5. Finger spring: The participant is asked to wrap a wide rubber band around the outside of the thumb and fingers. To stretch the rubber band, the participant is asked to spread his/her fingers. The participant performs three sets of fifteen reps.

The study group (B) involved 20 de Quervain's tenosynovitis participant who received Ultrasound, Transverse friction massage over the radial side of the wrist and Muscle strengthening exercise same as control group plus the application of pulsed radiofrequency.

The equipment used for radiofrequency was (FISIOLINE RADIANT 200, made in Italy), the treatment consist of Phase 1, use resistive head (40 mm) with a frequency of 615 KHz in a circular motion on the thumb side of wrist near base of the thumb for 10 minutes, followed by phase 2, use capacitive head (60 mm) with frequency of 532 KHz in a circular motion on the thumb side of wrist near base of the thumb for another 10 minutes, while the ground electrode was applied to the participant arm (Figure 2).



Figure 2. A: de Quervain tenosynovitis program; B: resistive head; C: resistive head and d: ground electrode)

Outcome measures

Each patient received a thorough explanation of all test methods before participating. The pain severity, grip and pinch strength of subjects with de Quervain's tenosynovitis were evaluated. All subjects were measured both before and after the interventions, which lasted for four weeks.

An analog visual scale was used to gauge the level of pain (VAS). Participants were asked to rate their level of discomfort before and at the end of treatment sessions on a scale that had 10 horizontal lines with anchor points of 0 (no pain) and 10 (highest pain) [17].

The Jamar hand dynamometer (Jamar plus digital hand dynamometer, by Sammons Preston, made in the USA) was used to measure grip strength while the patient was seated comfortably and held the device in the hand that was being tested with the arm at a right angle and the elbow by the side of the body. The base of the device rested on the first metacarpal, and the handle rested on the middle of the four fingers. The patient then squeezes the hand dynamometer for at least five seconds using their greatest isometric effort. Other body parts cannot be moved by the patients. Two minutes of resting time were allowed in between each of the three measures, which were repeated. Next, averaging these three measurements [18].

A pinch gauge (Lafayette Instrument Co., model pg-30; B&L Engineering, Santa Fe Springs, made in USA) was employed to assess pinch strength as the patient sat comfortably and ap-

plied a key pinch (the pinch gauge was held between the thumb's pad and the lateral surface of the index finger). Two minutes of relaxation time were allowed in between each of the three measures, which were repeated. Next, averaging these three measurements [19].

Statistical analysis

Due to the dearth of pertinent literature and the challenges involved in determining the extent of the effect, a pilot study with ten patients was conducted. A minimum appropriate sample size of 20 patients in each group was established using G*POWER statistical software (version 3.1.9.2; Franz Faul, Universitat Kiel, Germany) for the current study. Calculations were made using $\alpha = 0.05$, $\beta = 0.2$ and effect size = 0.38 and allocation ratio $N2/N1 = 1$.

The Statistical Software for the Social Sciences, Windows Version 23, was employed to perform statistical analysis (SPSS, Inc., Chicago, IL, USA). The dependent variable, with an a priori alpha of 0.05 and a 95% confidence interval, was the interaction of group and time. With the use of statistics, an intention-to-treat strategy was used for the analysis.

Results

Participant demographic data

Each group consisted of 20 participants; there was no significant difference among the two groups of age, weight, height and BMI ($p > 0.05$) as in (Table 1).

Table 1. Comparison of age, weight, height and BMI between groups (A and B)

	Control group (A) Mean $\pm$ SD	Study group (B) Mean $\pm$ SD	t-value	p-value	Level of significant
Age [years]	43.01 $\pm$ 5.18	42.05 $\pm$ 4.29	0.63	0.531	NS
Weight [kg]	74.15 $\pm$ 6.11	74.01 $\pm$ 6.63	0.07	0.941	NS
Height [m]	1.62 $\pm$ 0.07	1.63 $\pm$ 0.08	0.13	0.9	NS
BMI [kg/m ²]	28.11 $\pm$ 1.01	27.94 $\pm$ 0.73	0.61	0.544	NS

SD: standard deviation; t-value: unpaired test value; p-value: probability value; NS: non-significant

Gender distribution

The gender distribution of control group (A) and study group (B)

showed that there was no significant difference between the two groups ($p > 0.05$) as in (Table 2).

Table 2. Comparison of the frequency distribution and chi squared test for gender distribution between groups (A and B)

	Control group (A)	Study group (B)	X ² -value	p-value	Level of significant
Females	18 (90%)	17 (85%)	0.065	0.303	NS
Males	2 (10%)	3 (15%)			

X²: chi squared value; p-value: probability value; NS: non-significant

Measured variables

Pre- treatment comparison between the two groups

When comparing the pre- treatment value of VAS, Grip strength and Pinch strength values between two groups, the non significant differences were revealed of all measured variables between the two groups ($p > 0.05$) (Table 3).

Pre and post- treatment comparison for control group (A)

When comparing the pre and post- treatment value of VAS, Grip strength and Pinch strength values for control group (A), the significant differences were revealed of all measured variables ($p < 0.05$) (Table 3).

Pre and post- treatment comparison for study group (B)

When comparing the pre and post- treatment value of VAS, Grip strength and Pinch strength values for study group (B), the significant differences were revealed of all measured variables ($p < 0.05$) (Table 3).

Post- treatment comparison between the two groups

When comparing the post- treatment value of VAS, Grip strength and Pinch strength values between two groups, the significant differences were revealed of all measured variables between the two groups ($p < 0.05$) (Table 3).

Table 3. Comparison of VAS, grip strength and pinch strength for the two groups

		Control group (A) Mean $\pm$ SD	Study group (B) Mean $\pm$ SD	% of improvement	p-value
VAS	Pre- treatment	7.6 $\pm$ 0.5	7.45 $\pm$ 0.68	-	0.436 ^{NS}
	Post- treatment	5.05 $\pm$ 0.69	3.6 $\pm$ 0.6	28.71%	0.0001 ^S
	% of improvement	33.55%	51.68	-	-
	p-value	0.0001 ^S	0.0001 ^S	-	-
Grip strength	Pre- treatment	32.11 $\pm$ 4.16	33.81 $\pm$ 3.05	-	0.148 ^{NS}
	Post- treatment	40.36 $\pm$ 4.5	47.07 $\pm$ 3.88	6.71%	0.0001 ^S
	% of improvement	25.69%	39.21%	-	-
	p-value	0.0001 ^S	0.0001 ^S	-	-
Pinch strength	Pre- treatment	10.38 $\pm$ 2.03	11.34 $\pm$ 1.61	-	0.106 ^{NS}
	Post- treatment	15.24 $\pm$ 1.97	19.6 $\pm$ 2.11	28.61%	0.0001 ^S
	% of improvement	46.82%	72.83	-	-
	p-value	0.0001 ^S	0.0001 ^S	-	-

SD: standard deviation; % of improvement: percentage of improvement; p-value: probability value; NS: non-significant; S: significant

Discussion

This study's objective was to assess radiofrequency's effectiveness in treating de Quervain tenosynovitis patients. In the treatment of patients with de Quervain's tenosynovitis, the results of this study demonstrated that the combination of radiofrequency with ultrasound, transverse friction massage, and strengthening exercise had a superior effect on improving all outcome measures than ultrasound, transverse friction massage, and strengthening exercise. The percentage of improvement in VAS was 28.7%, grip strength was 6.71%, and pinch strength was 28.6%.

Up to author knowledge, there have been no studies on the effectiveness of radiofrequency in treating de Quervain's tenosynovitis but this study's outcomes are consistent with prior studies showing that pulsed radiofrequency is beneficial in reducing pain and enhancing function.

The current findings are consistent with a study by Al-Badawi [20] that involved 40 patients with temporomandibular joint

disorders (20 placebos and 20 interventions), and found that those who received pulsed radiofrequency treatment had significantly less pain than those who did not, as well as improved mouth opening and range of motion.

Additionally, Pihut [21] was based on 20 cases that had high myelogenous pain components and 20 controls. The intervention group underwent a total of 10 pulsed radiofrequency treatments, each lasting 10 minutes and having a frequency of 3 MHz and an energy level of 20 J. The results demonstrated a substantial variance in the severity of masticatory muscle pain between the two groups, with pulsed radiofrequency recipients experiencing less pain.

Additionally, a research by Brook et al. [22] reported results for 6 cases with intractable plantar fasciitis that were at least 6 months old and did not improve with conventional therapy alone. The outcomes demonstrated that pulsed radiofrequency therapy resulted in complete or almost complete pain relief.

Moreover, a study done by Bianchi et al. [23] that used pulsed

radiofrequency electromagnetic therapy on 50 consecutive patients who underwent a reverse shoulder prosthesis or total knee arthroplasty found that this treatment is a safe, effective, drug-free way to manage wound healing and postoperative pain in patients who receive these procedures.

In contrary Erdine et al. [24] found that pulsed radiofrequency was ineffective for the treatment of trigeminal neuralgia.

The improvement attributed to this study may be due to pulsed radiofrequency stimulation's ability to reduce pain. Although the actual process by which PRF stimulation reduces pain is still not fully known, numerous potential theories have been put forth. By increasing the expression of c-fos in the dorsal horn of the spinal cord and decreasing microglial activity, PRF stimulation prevents the spread of pain signals while maintaining the activation of pain-inhibitory processes [25, 26].

Microglia was also observed to be downregulated following PRF stimulation. Downregulating the microglia may prevent the development of chronic pain since they release various cytokines that regulate the pain signal and contribute to the onset of pain [24]. Additionally, PRF stimulation seldom destroys the larger, unrelated-to-pain sensory fibers (A-beta fibers), but it does tiny damage to the main sensory nociceptive sensory fibers (C-fibers and A-delta fibers) [27].

The main objectives of pain management are to lessen discomfort and enhance physical function [28], hence in our investigation, the greater gains in grip and pinch strength in group B may be related to the reduction of pain brought on by radiofrequency.

The fact that ultrasonic therapy speeds up healing by boosting blood flow in the treated area may be responsible for the improvement in the study and control group. Edema and swelling, the two main sources of discomfort, are reduced by it. The muscles, tendons, and ligaments in the treated area are given a gentle massage by ultrasound waves. This softens any scar tissue that is often present in an injured location and speeds up damaged tissue repair without putting an additional burden on it [29].

This finding is consistent with statements made by Oztas [30] and Szumski AJ [31] that the thermal effects of ultrasound relieve pain. Oztas also noted that ultrasound is mostly beneficial in reducing pain, edema, swelling, and weakened muscles.

Due to better lymphatic drainage, improved venous return, improved neuronal activation, and relaxation, massage may potentially have an impact on pain and may be responsible for the improvement in the study and control group. The research by Smith et al. [32] and Hilbert et al. [33] supports these findings.

Limitations

The study had an age restriction (35-50). The lack of follow-up makes it difficult to gauge how long these changes would persist in the participants because there has been no prior research on the use of radiofrequency in the treatment of de Quervains tenosynovitis. The authors advise future researchers to target various age groups in their sample and include various follow-up times in their study design in light of this. Additionally, only forty people were included in the sample, which may limit generalization. However, in order to identify the bare minimum a necessary number of participants, the authors performed a power test.

Strength

The current study's point of strength is that it attempts to address the unanswered topic of the role of radiofrequency in the treatment of de Quervains tenosynovitis using an objective, valid, and reliable measurement tool.

Weakness

No study regarding the adoption of radiofrequency in the treatment of de Quervains tenosynovitis could be viewed as a weakness criterion.

Conclusion

In comparison to ultrasound, transverse friction massage, and strengthen exercise, radiofrequency plus ultrasound, transverse friction massage, and strengthen exercise improved pain intensity, hand grip strength, and pinch strength in participants with de Quervain's tenosynovitis more effectively.

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