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DI GENOVA

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Scuola di Scienze Mediche e Farmaceutiche

Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienze Materno-Infantili

Master in Riabilitazione dei Disordini Muscoloscheletrici

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Arthrodesis Versus Arthroplasty in thumb carpometacarpal osteoarthritis. Impact on maximal voluntary force, endurance and precision of pinch

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ABSTRACT

Background: Arthrodesis and arthroplasty are the two main approach adopted for surgical management of carpometacarpal osteoarthritis. Nevertheless, effects on strength recovery and hand functionality are still debated.

Aim: To investigate differences of pinch strength recovery among patients with carpometacarpal osteoarthritis underwent arthrodesis and arthroplasty.

Method: Thirty-seven subjects underwent arthrodesis or arthroplasty for carpometacarpal osteoarthritis participates. Maximal voluntary contractions (MVC) of pinch strength were acquired. MVC were recorded by an acquisition system consisting of a haptic device equipped with a load cell, which analogic signal was acquired and converted to digital signal for visual feedback. Dynamic force was assessed by a task consisting of 10 targets at 70% of MVC. Resistance force was assessed by maintaining pinch strength at 30% of MVC. Task performance was quantified by mean distance (MD) and offset error (OE) from the reference target force as error indices, and standard deviation (SD) of force was used as index of force steadiness. The 9-HPT was administered to assess hand dexterity; SF-12 and DASH questionnaires were administered for assessment of thumb joint condition.

Results: Arthrodesis group obtained significantly higher MVC values and better results at DASH and SF-12 than arthroplasty. No significant differences were found for pinch endurance and dexterity of the hand. No significant differences were found at dynamic force assessment except for SD.

Conclusion: Arthrodesis approach permit to obtain higher level of strength and improved functionality of the hand than arthroplasty. Arthroplasty approach seems to be able to obtain better results in terms of precision of the pinch.

INTRODUCTION

Among all musculoskeletal disorders of the hand, osteoarthritis (OA) is certainly the most common disease, and carpometacarpal joint of the thumb (CMC) represents the most affected site [1]. The estimated prevalence of CMC OA is about 15% in people aged over 30 [2], and radiographic prevalence is 38.5% in people aged over 55 [3]. Individuals with CMC OA report significant pain and disability in their everyday life and consider CMC OA to be a serious condition [4]. The most common symptoms of CMC OA are stiffness of CMC joint, loss of pinch strength [5] and pain at the base of the thumb, that impact hand function and the ability to perform resistive pinch tasks of daily life such as clipping nails, turning keys, or opening food packages [6]. Hand function is assessed both trough patient-reported questionnaires and physical measurements [5]. Pinch strength has been widely used in clinical practice as an objective index for measuring functionality of the upper limbs [6], and it reflects the functional integrity of the hand [7]. Although maximal static pinch force is a well-established outcome [8], it can't quantify alone the sensorimotor integration necessary to perform most of the daily tasks that require sub-maximal forces [9] and the ability to maintain and adapt pinch strength. Conservative treatment should be considered as the first approach in the management of CMC OA diseases, however, it is unclear which conservative measures are most effective [10]. If conservative treatment fails, surgical treatment is considered. The two main surgical techniques used for the treatment of thumb carpometacarpal osteoarthritis are arthrodesis and arthroplasty. Nowadays, achievable results in terms of strength recovery and hand functionality between these surgical approaches are still unclear [11–13]. Therefore, the purpose of our study is to investigate and compare the effects of these surgical techniques in terms of quality of life, dexterity, pain and strength of the hand.

MATERIALS AND METHODS

Design

This study uses a cross-sectional design, and includes data from the Regional Center of Hand Surgery (San Paolo Hospital) from February 2011 to October 2018.

Study population

Convenience sample was used for the study. Thirty-seven subjects (42 hands), aged between 48 and 70 years, with previous CMC OA grade III/IV for the Eaton-Littler classification underwent arthroplasty or arthrodesis were enrolled in the study and were

allocated in two different groups. The cohort was subdivided in two subgroups: all the subjects underwent arthrodesis were allocated in the first group (22 subjects), and in the second group were allocated subjects underwent arthroplasty (20 subjects). All the selected participants were contacted by phone and asked to participate in the study. Participants had to sign an informed consensus. Patients were excluded if one of the following conditions was present: concurrent musculoskeletal hand/wrist pathologies (as carpal tunnel syndrome, de Quervain), systemic diseases (as rheumatoid arthritis), complex regional pain syndromes and neurological pathologies, acute inflammatory state of the CMC joint during the week before the assessment, medication usage (anticonvulsants, narcotics, opioids, muscle relaxant drugs).

Data collection

Gender (M/F), age (years), BMI, dominant hand (right/left), site of surgery (right/left), surgical approach (arthrodesis/arthroplasty), work typologies (blue/white collar or other), comorbidities and drug therapies were collected. The pain intensity at the moment of assessment and during the week before were assessed by a numeric rating scale (NRS), which has been widely used in different adult populations, including those with rheumatic diseases [14–19]. Subjects had to mark on the NRS the intensity of pain at the moment of the test and the perceived pain in the last week.

Hand perceived disability and the perceived quality of life were assessed by the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire and the Short Form (SF-12) Health Survey. The DASH is a 30-item, self-report questionnaire designed to measure physical function and symptoms in patients with any or several musculoskeletal disorders of the upper limb. Items are scored from 1 to 5 and the greatest possible score is 100 and the minimum 30. Raw score is converted in a 0 to 100 scale, where 0 reflects the lack of disability (good functioning) and 100 reflects the highest disability (bad functioning). The questionnaire was designed to help describe the disability experienced by people with upper-limb disorders and also to monitor changes in symptoms and function over time. Tests have shown that the DASH performs well in both these roles. It gives clinicians and researchers the advantage of having a single, reliable instrument that can be used to assess any joints in the upper extremity [20, 21]. In this study the Italian version of the DASH questionnaire was administered [22]. The SF-12 is a 12-item, patient-reported survey of patient health [23], shortened form of the SF-36. The SF-12 analysed eight health concepts: physical functioning, bodily pain, role limitations due to physical health problems, role

limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions. A questionnaire set consisting of the SF-12 and the DASH was proposed for the comprehensive and specific assessment of thumb joint condition [24].
Dexterity of the hand was assessed with the 9 Hole Peg Test (9-HPT) [25, 26].

Force transducer

The pinching force was assessed by an acquisition system consisting of a load cell made of AISI 630 steel (Deltatech P502.F-S/250N), with a measuring range of ±250 N and a nominal offset of ±0,075 mV/V (EMAC s.r.l., Genoa, Italy), which analogic signal is acquired and converted to digital signal for visual feedback generation by a computer with a dedicated software and for subsequent analysis.

Fig. 1 *Pinch force assessment device*

Procedures

The subject was seated on a height-adjustable chair in front of a table with the PC monitor positioned at a distance of 60 cm (Fig. 2). The subject was asked to keep the trunk in an erect posture, not leaning on the chair, with a natural head position and the feet well placed on the floor (90° of hip, knees and ankle flexion). The subject was asked to maintain the forearm of the tested arm lying on the table up to the elbow (3/4 of the forearm on the table and the elbow off), in a neutral position of pronation-supination with a slight extension of the wrist (approximately 30°). The examiner had to make sure the height of the chair was correct (90° of elbow flexion) and that the non-tested arm was lying on the thigh of the subject. The

subject was asked to maintain the sensor with a pinch grip between first and second finger maintaining interphalangeal joints extended and fingers three to five flexed against the palm of the hand (Fig. 3). The signal of the force delivered by the subject's pinch grip was directly acquired by the computer, and a visual feedback was given to the patient.

Fig. 2 *Patient position*

Fig. 3 *Pinch force assessment position*

Maximal voluntary contraction (MVC)

The subject had to pinch the device with the maximal available strength. During the pinch MVC registration, the subject could visualise the force exerted via a visual feedback displayed on the PC screen and was encouraged to get the maximal value. Two execution of pinch MVC were performed, with an interval of 30 seconds in between, and only the highest value was recorded as reference value [27].

Dynamic force assessment (DF)

The task consisted in reaching and holding the position of the cursor, by modulating force of the pinch, on a target level of 70% of the MVC. A total of 10 target of 5 seconds each separated by 10 seconds of resting interval were administered to the subject.

Pinch endurance assessment (PE)

The task consisted in reaching and maintaining the position of the cursor on a target at 30% of the MVC as long as possible. The task is stopped if the cursor exited from a tolerance range of 10% MVC for more than 2 seconds.

Force measure

The maximal pinch force, the time duration in the endurance task, the precision, and the steadiness obtained during pinch tasks were registered for each subject. Precision and steadiness of the individual performance were assessed respectively by Mean Distance (MD), Offset Error (OE), and Standard Deviation (SD).

MD represented the average cursor-target distance, OE was calculated as the distance between the average cursor position and the target, and SD was calculated as the standard deviation of the subject's force despite the target force [27]. While the three indices are mutually dependent, they provide a different functional meaning. SD is an indicator of force unsteadiness: the spread of the cursor trajectory around the target can be a measure of precision; OE indicates whether there is an offset between the average cursor position and the target and it is a measure of accuracy. MD is an overall matching error index which depends on both OE and SD [28].

Data analysis

IBM SPSS Statistics 22 was used for statistical analysis. Nonparametric statistical analyses were performed to account for the relatively small sample of the groups. The Mann-Whitney test were applied to evaluate differences between groups (arthrodesis and arthroplasty) for all force variables (MVC, MD, OE and SD) and outcome measures (DASH, SF-12, NRS, 9HPT). Furthermore, the Spearman rank correlation was applied to assess correlation among variables. Results are reported as mean and SD in the text. Statistical significance was set at $p < 0.05$.

RESULTS

Baseline characteristics of subjects are presented in Table 1. No significant differences in age, BMI, and time since surgery were detected between groups (all $p > 0.05$).

Table 1 Baseline Characteristics of the Arthrodesis and Arthroplasty Groups

Characteristic	Arthrodesis (n=22)	Arthroplasty (n=20)
Age (y)	57.95 ± 6.43	57.40 ± 4.86
Sex (% female)	63.6	80.0
BMI	23.89 ± 4.47	25.89 ± 4.05
Site of surgery (% dominant hand)	40.9	50.0
Time since intervention (months)	42.05 ± 27.84	26.50 ± 15.77
Current Pain Intensity (NRS)	0.91 ± 2.00	0.65 ± 1.57
SF-12		
Physical	48.91 ± 6.47	43.04 ± 8.00
Mental	54.08 ± 6.07	47.10 ± 12.17
DASH (%)	12.65 ± 12.81	21.79 ± 14.70
9HPT (s)	20.38 ± 5.89	19.16 ± 5.98

In the DASH questionnaire (Fig. 4) the arthrodesis group scored a mean value of 12.65 (SD = 12.81), while the arthroplasty group scored a mean value of 21.79 (SD = 14.70), showing a statistically significant difference among groups ($p < 0.05$). In the SF-12 questionnaire the arthrodesis group scored a mean value of 48.91 (SD = 6.47) in the physical health composite summary (PCS) and a mean value of 54.08 (SD = 6.07) in the mental health composite summary (MCS), while the arthroplasty group scored a mean value of 43.04 (SD = 8.00) in the PCS and a mean value of 47.10 (SD = 12.17) in the MCS (Fig. 5). Statistically significant difference was found for the PCS ($p < 0.05$) but not in the MCS despite p value was close to the significance ($p = 0.06$). Dexterity of the hand assessed by 9-HPT didn't show a statistically significant difference among groups (Fig. 6).

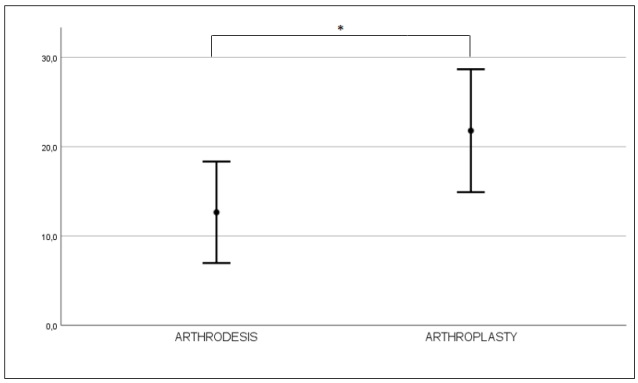

***Fig. 4 DASH questionnaire**.*
*Arthrodesis group showed a mean value of 12.65 ($IC_{95\%}$ 6.97 – 18.33), while arthroplasty group showed a mean value of 21.79 ($IC_{95\%}$ 14.91 – 28.67); * Significance p<0.05.*

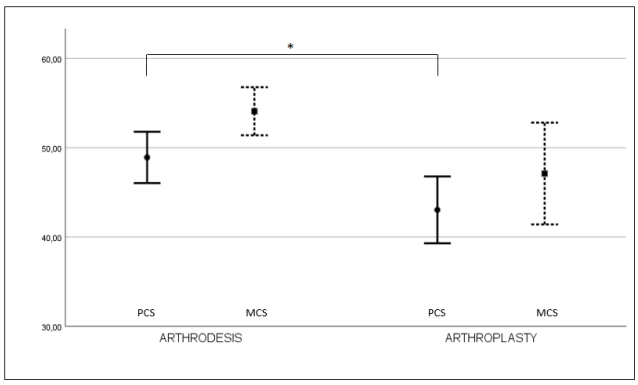

Fig. 5 SF-12 questionnaire.
In the Physical Component Score (PCS) arthrodesis group showed a mean value of 48.91 ($IC_{95\%}$ 46.04 – 51.78), while arthroplasty group a mean value of 43.04 ($IC_{95\%}$ 39.30 – 46.78). In the Mental Component Score (MCS) arthrodesis group showed a mean value of 54.08 ($IC_{95\%}$ 51.39 – 56.77), while arthroplasty group a mean value of 47.10 ($IC_{95\%}$ 41.40 – 52.80).
** Significance $p<0.05$.*

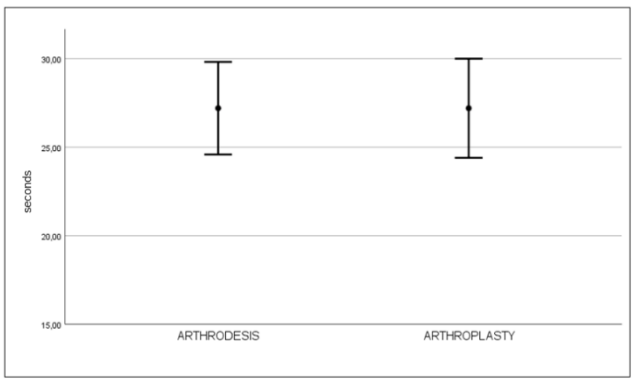

Fig. 6 9-Hole Peg Test.
Arthrodesis group showed a mean value of 20.38 sec ($IC_{95\%}$ 17.77 – 22.99), while arthroplasty group showed a mean value of 19.16 sec ($IC_{95\%}$ 16.36 – 21.96).

Force

The force variables acquired in the two groups are presented in Table 2. Subjects underwent arthrodesis showed significantly greater values at MVC than the arthroplasty group ($p < 0.05$), 3.34 kg (SD = 1.74), and 2.50 kg (SD = 0.85), respectively (Fig.7). For DF, no significance differences were found for MD and OE, while there was significant difference in SD ($p < 0.05$), in which the arthrodesis group scored a mean value of 11.59 (SD = 6.21) and arthroplasty group scored a mean value of 7.90 (SD = 3.35) (Fig. 8). Furthermore, analysis of Intraclass Correlation Coefficient (ICC) revealed a high repeatability of the task in both arthrodesis and arthroplasty groups. For PE, no significance differences were found among groups for time, MD, OE and SD (Fig. 9).

Table 2 Force Variables

Force variable	Arthrodesis	Arthroplasty
MVC (Kg)	3.34 ± 1.74	2.50 ± 0.85
Dynamic Force		
MD (%)	8.32 ± 6.92	13.65 ± 13.79
OE (%)	-8.73 ± 10.67	-12.85 ± 21.82
SD (%)	11.59 ± 6.21	7.90 ± 3.35
ICC (Cronbach Alpha)	0.969	0.973
Pinch Endurance		
Time (min)	2.55 ± 1.45	2.31 ± 1.29
MD (%)	6.93 ± 3.43	6.97 ± 3.05
OE (%)	-4.22 ± 4.52	-3.08 ± 6.01
SD (%)	6.73 ± 3.41	5.15 ± 2.79

Values of arthrodesis and arthroplasty groups are presented as mean ± SD.

In addition, the correlation between force variables and outcomes regarding DASH, SF-12, and 9-HPT was analysed. Significant correlation was found for MVC and 9-HPT (r = -0.319; $p < 0.05$) (Fig. 10) and DASH (r = -0.483; $p = 0.001$) respectively. Moreover, regarding MVC and DASH correlation (Fig. 11), it was found that correlation in arthrodesis group (r = -0.521) (Fig. 12) was significantly stronger than correlation in arthroplasty group (r = -0.223) (Fig. 13), even if no significant difference was found between the two groups.

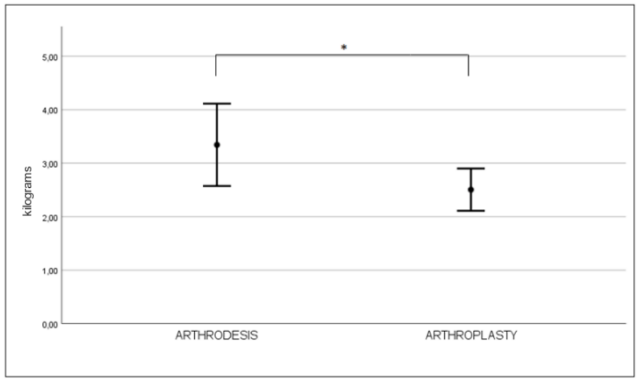

Fig. 7 Maximal Voluntary Contraction (MVC).
*Arthrodesis group showed a mean value of 3.34 kg ($IC_{95\%}$ 2.57 – 4.11), while arthroplasty group showed a mean value of 2.50 kg ($IC_{95\%}$ 2.10 – 2.90); * Significance p<0.05.*

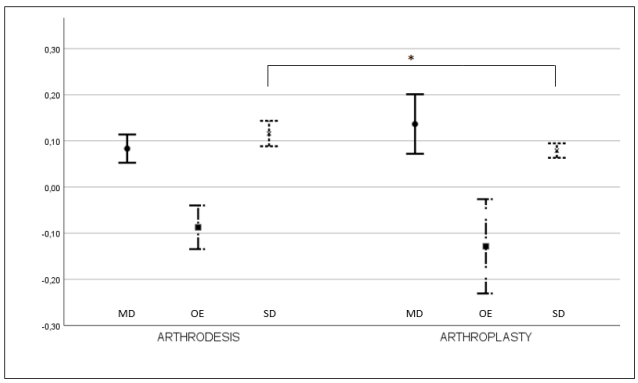

Fig. 8 Dynamic Force assessment (DF).
*In the Mean Distance (MD) arthrodesis group showed a mean value of 8.32 ($IC_{95\%}$ 5.25 – 11.39), while arthroplasty group a mean value of 13.65 ($IC_{95\%}$ 7.20 – 20.10). In the Offset Error (OE) arthrodesis group showed a mean value of -8.73 ($IC_{95\%}$ -13.46 – -4.00), while arthroplasty group a mean value of -12.85 ($IC_{95\%}$ -23.06 – -2.64). In the Standard Deviation (SD) arthrodesis group showed a mean value of 11.59 ($IC_{95\%}$ 8.84 – 14.34), while arthroplasty group a mean value of 7.90 ($IC_{95\%}$ 6.33 – 9.47). * Significance p<0.05.*

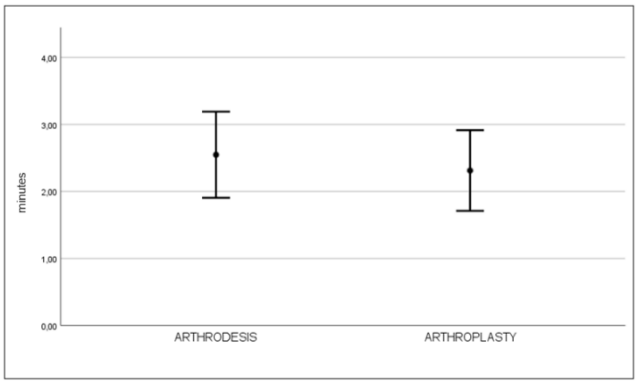

Fig. 9 Pinch Endurance assessment (PE).
Arthrodesis group showed a mean value of 2.55 min ($IC_{95\%}$ 1.91 – 3.19), while arthroplasty group showed a mean value of 2.31 min ($IC_{95\%}$ 1.71 – 2.91).

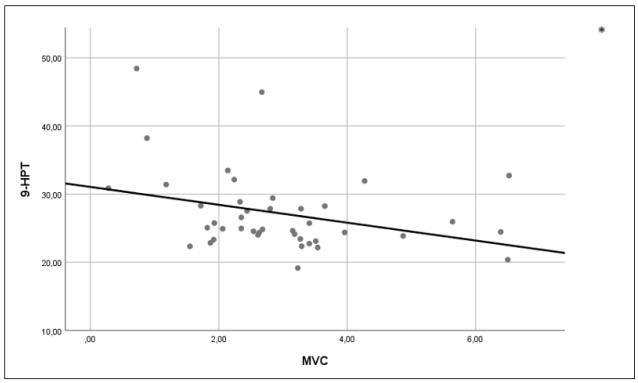

Fig. 10 Maximal Voluntary Contraction (MVC) – 9-Hole Peg Test (9-HPT) overall correlation.
*MVC and 9-HPT showed moderate correlation (Rho= -0.319). * Significance p<0.05.*

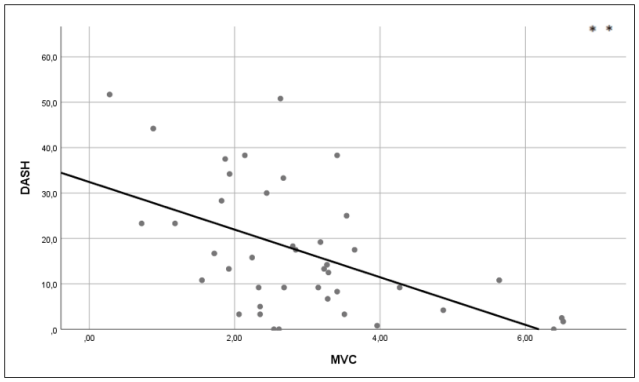

Fig. 11 Maximal Voluntary Contraction (MVC) – DASH questionnaire overall correlation.
*MVC and DASH showed high correlation (Rho= -0.483). ** Significance p=0.001.*

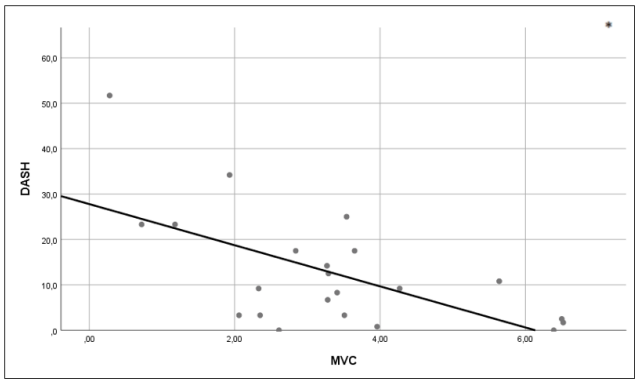

Fig. 12 Maximal Voluntary Contraction (MVC) – DASH questionnaire arthrodesis correlation.
MVC and DASH questionnaire in the arthrodesis group showed high correlation (Rho= -0.521).
** Significance p<0.05.*

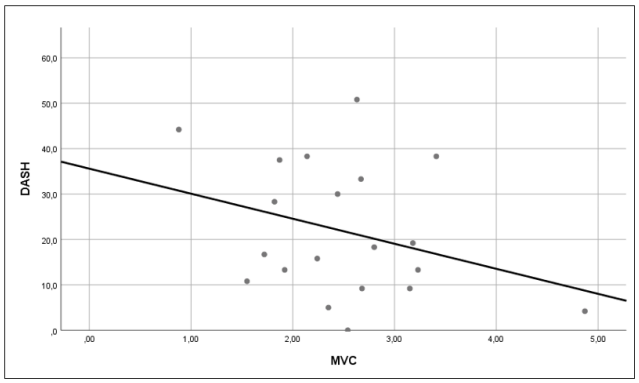

Fig. 13 Maximal Voluntary Contraction (MVC) – DASH questionnaire arthroplasty correlation.
MVC and DASH questionnaire in the arthroplasty group showed moderate correlation (Rho= -0.223).

DISCUSSION

Aim of our study was to investigate any differences between subjects underwent arthrodesis or arthroplasty surgery for thumb CMC osteoarthritis in terms of quality of life, dexterity and strength recovery of the hand assessing the pinch strength.

In this paper an innovative system for pinch force assessment was proposed, which converted in a visual feedback the measured pinching force and provides an objective assessment of the pinch force control by engaging the subject in an intuitive “reach-and-hold” type of task.

This study demonstrated that subjects underwent arthrodesis surgery showed better results in the MVC task, DASH questionnaire and SF-12 PCS compared to arthroplasty group. For the maximal pinch strength, although other studies demonstrated no statistically significant differences among groups [11, 12, 29, 30], this study highlighted that subjects underwent arthrodesis surgery performed significantly better in this task.

This difference could be due to joint stability obtained by arthrodesis approach [31] that could lead to a lower force dissipation during MVC task than with arthroplasty approach. This higher level of MVC was reflected in a better functional recovery of the upper arm, as assessed by the DASH questionnaire. Additionally, in the arthrodesis group there was a stronger correlation between these two outcomes, showing that an improvement in the MVC could lead to a higher improvement of functionality of the hand, resulting in a gain of performance of the upper arm during activities of daily living. In the assessment of dynamic force, arthroplasty group showed significantly better results in terms of SD, meaning that this approach could result in a higher maintenance of the steadiness of the pinch strength. These results suggested that the decision on which surgical approach has to be preferred must be tailored on patient clinical situation and functional request. Hypothetically, arthrodesis approach could be advantageous in all that cases in which functional request is related to higher needs of strength, as in manual works that overload thumb structures [32]. Otherwise, cases in which functional request is based on precision abilities, the arthroplasty approach should be preferred.

Study limitations

The current study has some limitations. First, in our sample we included thirty-seven subjects underwent surgery for thumb CMC osteoarthritis of which 72% were women. Thumb CMC osteoarthritis is more common in females [2, 3, 33], so a higher frequency of women to men was expected. Second, although there is no significant difference between

groups, this study included subjects from six months to eight years after surgery. Furthermore, for the pinch grip examined in this study normative data are not available, so that results of this study couldn't be compared with strength level among health population. Particularly, during strength analysis it was not possible considering and adjusting data on the basis on which is the normal relationship between dominant and non-dominant hand because only the hand underwent surgery was tested.

CONCLUSION

Results of this study suggested that arthrodesis approach as surgical treatment for thumb CMC OA allow to obtain higher levels of pinch strength and an improved functionality of the hand and upper arm in comparison to the arthroplasty approach. Moreover, arthroplasty approach permits to achieve better results in terms of precision of the pinch strength. Although several limitations of this study, these results could help surgeons in the decision making process on which surgical approach has to be preferred based on the patient functional demand.

ABBREVIATIONS

9-HPT	9 Holes Peg Test
CMC	Carpometacarpal
DASH	Disability of the Arm, Shoulder and Hand questionnaire
DF	Dynamic Force assessment
ICC	Intraclass Correlation Coefficient
MCS	Mental Composite Score
MD	Mean Distance
MVC	Maximal Voluntary Contraction
NRS	Numeric Rating Scale
OA	Osteoarthritis
OE	Offset Error
PCS	Physical Composite Score
PE	Pinch Endurance assessment
SD	Standard Deviation
SF-12	Short Form of Health Survey

APPENDIX

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MODULO DI INFORMAZIONE PER CONSENSO INFORMATO

Titolo dello studio:	Artrodesi versus Artroplastica nel trattamento della artrosi carpometacarpale del pollice. Impatto sulla massima forza volontaria, sulla resistenza e sulla precisione della pinza pollice-indice. *Versione 1.0 29 Gennaio 2019*
Responsabile Scientifico dello studio:	Dott. Marco Testa
Telefono:	+39 019860250 +39 3289213515
Indirizzo:	Campus Universitario di Savona, Via Magliotto 2, 17100 Savona

Introduzione

Lei è invitato a prendere parte a uno studio che mira ad indagare quali sono le eventuali differenze, in termini di qualità di vita quotidiana, di forza di presa, di destrezza della mano e di dolore in soggetti affetti da rizoartrosi sottoposti a chirurgia.

Questo studio è promosso da Marco Testa, ricercatore SSD MED 48 presso il Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienze Materno-Infantili (DINOGMI) della Università degli Studi di Genova.

Prima di decidere, è importante che Lei comprenda le ragioni per le quali la ricerca sarà condotta e cosa essa comporterà. Prenda tutto il tempo necessario per leggere con attenzione le informazioni che seguono.

Il presente studio ha lo scopo di studiare la presenza di eventuali differenze in termini di qualità della vita, di forza di presa, di destrezza della mano e di dolore in persone affette da rizoartrosi, sottoposte a intervento chirurgico di artrodesi o artroplastica.

I risultati dello studio potrebbero aiutarci a comprendere meglio come l'approccio chirurgico, in persone affette da rizoartrosi, possa influenzare il recupero funzionale della mano e il miglioramento in termini di qualità della vita.

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L'indagine viene effettuata inizialmente attraverso la somministrazione di una serie di questionari che le sarà chiesto di compilare con la massima attenzione. Successivamente, sarà sottoposto ad una valutazione della forza e della destrezza della sua mano attraverso l'impiego di test clinici specifici. La valutazione avrà una durata complessiva di circa 30 minuti. Lei è stato scelto perché il suo nominativo è inserito nelle liste di pazienti affetti da rizoartrosi sottoposti a chirurgia presso il Centro Regionale di Chirurgia della Mano dell'ospedale San Paolo di Savona.

La partecipazione a questo studio è volontaria e totalmente anonima. Le informazioni che fornirà saranno gestite direttamente dai ricercatori dagli sperimentatori e non saranno rese disponibili a soggetti terzi. Per la pubblicazione ed un possibile confronto dei risultati saranno utilizzati solo dati anonimi e risultati aggregati.

Questa è un'indagine gestita e condotta direttamente dal gruppo di ricerca coordinato dal dott. Marco Testa e afferente al Dipartimento di Neuroscienze, Riabilitazione, Oftalmologia, Genetica e Scienza Materno-Infantili dell'Università di Genova; ogni informazione sarà gestita in modo strettamente confidenziale e i suoi dati saranno trattati nel rispetto della normativa vigente sul trattamento dei dati personali Regolamento UE 2016/679 (GDPR – *General Data Protection Regulation*) e D.Lgs. 30/6/2003, n. 196 (Codice in materia di protezione dei dati personali).

Non è previsto un compenso per la partecipazione, ne sono addebitati costi per la stessa. Il Suo consenso può essere negato senza pregiudizio alcuno, semplicemente non proseguendo con la compilazione del questionario. Se Lei ha necessità di altre informazioni, o nel caso Lei abbia qualsiasi problema, preoccupazione o domande sullo studio, per favore si rivolga allo Sperimentatore, dott. Alberto Piacenza, tel. 338 4487379, alberto.piacenza@gmail.com.

Accetto di partecipare allo studio e di proseguire con la valutazione.

Luogo e Data Firma

SCHEDA DATI

DATA VALUTAZIONE _____ ID PAZIENTE _____

COGNOME _____ NOME _____

DATA e LUOGO DI NASCITA _____

CODICE FISCALE _____

RECAPITO TELEFONICO _____

PESO (Kg) _____ ALTEZZA (cm) _____ BMI _____

MANO DOMINANTE: ☐ DX ☐ SX MANO OPERATA: ☐ DX ☐ SX

INTERVENTO: ☐ ARTRODESI ☐ ARTROPLASTICA IN DATA _____

ATTIVITÀ LAVORATIVA:

☐ MANUALE ☐ UFFICIO ☐ CASALINGO/A

☐ PENSIONATO/A (EX _____) ☐ ALTRO _____

HA DOLORE ALLA MANO OPERATA? ☐ SÌ ☐ NO

SE SÌ, DA QUANTO TEMPO?

☐ DA 1 SETTIMANA ☐ DA 2-4 SETTIMANE ☐ DA 1-3 MESI

☐ DA 3-6 MESI ☐ DA 6-12 MESI ☐ DA 1-2 ANNI ☐ DA OLTRE 2 ANNI

TERAPIE FARMACOLOGICHE IN CORSO: ☐ SÌ ☐ NO

☐ IPNOINDUCENTI ☐ ANTICONVULSIVANTI ☐ MIORILASSANTI

☐ FANS ☐ OPPIACEI ☐ ALTRO _____

COMORBIDITÀ: ☐ SÌ ☐ NO

☐ PATOLOGIE MUSCOLOSCHELETRICHE ☐ PATOLOGIE NEUROLOGICHE

☐ CRPS ☐ ARTRITE REUMATOIDE ☐ ALTRO _____

QUESTIONARIO SULLO STATO DI SALUTE SF-12

ISTRUZIONI: Questo questionario intende valutare cosa Lei pensa della Sua salute. Le informazioni raccolte permetteranno di essere sempre aggiornati su come si sente e su come riesce a svolgere le Sue attività consuete.

Risponda a ciascuna domanda del questionario indicando la Sua risposta come mostrato di volta in volta. Se non si sente certo della risposta, effettui la scelta che comunque Le sembra migliore.

1. In generale, direbbe che la Sua salute è:

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /
Eccellente	**Molto buona**	**Buona**	**Passabile**	**Scadente**

Le seguenti domande riguardano alcune attività che potrebbe svolgere nel corso di una qualsiasi giornata. La Sua salute La limita attualmente nello svolgimento di queste attività?

	SI, mi limita parecchio	**SI, mi limita parzialmente**	**NO, non mi limita per nulla**
2. Attività di moderato impegno fisico,			
come spostare un tavolo, usare l'aspirapolvere, giocare a bocce o fare un giretto in bicicletta	/ 1 /	/ 2 /	/ 3 /
3. Salire **qualche** piano di scale	/ 1 /	/ 2 /	/ 3 /

Nelle ultime 4 settimane, ha riscontrato i seguenti problemi sul lavoro o nelle altre attività quotidiane, a causa della Sua salute fisica?

	SI	**NO**
4. Ha **reso** meno di quanto avrebbe voluto	/ 1 /	/ 2 /
5. Ha dovuto limitare alcuni **tipi** di lavoro o di altre attività	/ 1 /	/ 2 /

Nelle ultime 4 settimane, ha riscontrato i seguenti problemi sul lavoro o nelle altre attività quotidiane, a causa del Suo stato emotivo (quale il sentirsi depresso o ansioso)?

	SI	NO
6. Ha **reso** meno di quanto avrebbe voluto	/ 1 /	/ 2 /
7. Ha avuto un calo di **concentrazione** sul lavoro o in altre attività	/ 1 /	/ 2 /

8. Nelle ultime 4 settimane, in che misura il dolore l'ha ostacolata nel lavoro che svolge abitualmente (sia in casa sia fuori casa)?

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /
Per nulla	**Molto poco**	**Un po'**	**Molto**	**Moltissimo**

Le seguenti domande si riferiscono a come si è sentito nelle ultime 4 settimane.
Risponda a ciascuna domanda scegliendo la risposta che più si avvicina al Suo caso.
Per quanto tempo nelle ultime 4 settimane si è sentito…

	Sempre	**Quasi sempre**	**Molto tempo**	**Una parte del tempo**	**Quasi mai**	**Mai**
9. calmo e sereno?	/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /
10. pieno di energia?	/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /
11. scoraggiato e triste?	/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /

12. Nelle ultime 4 settimane, per quanto tempo la Sua salute fisica o il Suo stato emotivo hanno interferito nelle Sue attività sociali, in famiglia, con gli amici?

Sempre	**Quasi sempre**	**Molto tempo**	**Una parte del tempo**	**Quasi mai**
/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /

Questionario per l'arto superiore DASH

Istruzioni: Il presente questionario riguarda i Suoi sintomi e la Sua capacità di compiere alcune azioni. Risponda a **ogni domanda** facendo riferimento al Suo stato durante **l'ultima settimana**. Se non ha avuto l'opportunità di eseguire una delle azioni durante l'ultima settimana, risponda alla domanda **provando a immaginare** come avrebbe potuto eseguirla. Non importa con quale mano o braccio Lei esegue l'azione; risponda in base alla Sua capacità di compierla e senza tenere conto del modo in cui la compie.

Valuti la sua capacità di eseguire le seguenti azioni durante **l'ultima settimana**

		Nessuna difficoltà	**Lieve difficoltà**	**Discreta difficoltà**	**Notevole difficoltà**	**Non ci sono riuscito**
1.	Svitare il coperchio di un barattolo ben chiuso o nuovo	1	2	3	4	5
2.	Scrivere	1	2	3	4	5
3.	Girare una chiave	1	2	3	4	5
4.	Preparare un pasto	1	2	3	4	5
5.	Aprire spingendo una porta pesante	1	2	3	4	5
6.	Posare un oggetto su uno scaffale al di sopra della propria testa	1	2	3	4	5
7.	Fare lavori domestici pesanti (es. lavare i pavimenti o i vetri)	1	2	3	4	5
8.	Fare lavori di giardinaggio	1	2	3	4	5
9.	Rifare il letto	1	2	3	4	5
10.	Portare la borsa della spesa o una ventiquattrore	1	2	3	4	5
11.	Portare un oggetto pesante (oltre 5 Kg)	1	2	3	4	5
12.	Cambiare una lampadina posta al di sopra della propria testa	1	2	3	4	5
13.	Lavarsi o asciugarsi i capelli	1	2	3	4	5
14.	Lavarsi la schiena	1	2	3	4	5
15.	Infilarsi un maglione	1	2	3	4	5
16.	Usare un coltello per tagliare del cibo	1	2	3	4	5
17.	Attività ricreative che richiedono poco sforzo (es. giocare a carte, lavorare a maglia)	1	2	3	4	5
18.	Attività ricreative nelle quali si fa forza o si prendono colpi sul braccio, sulla spalla o sulla mano (es. usare il martello, giocare a tennis o a golf, ecc.)	1	2	3	4	5
19.	Attività ricreative che richiedono un movimento libero del braccio (es. giocare a frisbee, a badminton, ecc.)	1	2	3	4	5
20.	Far fronte alle necessità di spostamento (andare da un posto ad un altro)	1	2	3	4	5
21.	Attività sessuale	1	2	3	4	5

Durante **la settimana passata** in che misura il suo problema al braccio, alla spalla o alla mano ha interferito con le normali attività sociali con la famiglia, gli amici, i vicini di casa i gruppi di cui fa parte?

	Per nulla	Molto poco	Un po'	Molto	Moltissimo
22.	1	2	3	4	5

Durante **la settimana passata** è stato limitato nel suo lavoro o in altre attività quotidiane abituali a causa de suo problema al braccio, alla spalla o alla mano?

	Non mi ha limitato per nulla	Mi ha limitato leggermente	Mi ha limitato discretamente	Mi ha limitato molto	Non ci sono riuscito
23.	1	2	3	4	5

Valuti l'intensità dei seguenti sintomi durante **l'ultima settimana**

		Nessuna difficoltà	Lieve difficoltà	Discreta difficoltà	Notevole difficoltà	Non ci sono riuscito
24.	Dolore al braccio, alla spalla o alla mano	1	2	3	4	5
25.	Dolore al braccio, alla spalla o alla mano nel compiere una qualsiasi attività specifica	1	2	3	4	5
26.	Formicolio (sensazione di punture di spillo) al braccio, alla spalla o alla mano	1	2	3	4	5
27.	Deboleza al braccio, alla spalla o alla mano	1	2	3	4	5
28.	Rigidità del braccio, della spalla o della mano	1	2	3	4	5

Durante **l'ultima settimana** quanta difficoltà ha incontrato nel dormire a causa del dolore al braccio, alla spalla o alla mano?

	Nessuna difficoltà	Lieve difficoltà	Discreta difficoltà	Notevole difficoltà	Non sono riuscito a dormire
29.	1	2	3	4	5

Mi sento meno capace, meno fiducioso o meno utile a causa del mio problema al braccio, alla spalla o alla mano?

	Non sono assolutamento d'accordo	Non sono d'accordo	Non saprei	Sono d'accordo	Sono assolutamente d'accordo
30.	1	2	3	4	5

NRS pain scale

1. Come giudica il suo dolore in questo momento?

2. Come giudica mediamente il dolore che ha provato nell'ultima settimana?

9 Hole Peg Test

Mano ☐ dx ☐ sx Risultato: _____ sec

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