A comparison of nursing-related complications after coronary intervention through the radial or femoral artery

Ann. Ital. Chir., 2022 93, 5: 529-535
pii: S0003469X22035795

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A comparison of nursing-related complications after coronary intervention through the radial or femoral artery

OBJECTIVE: *This study was designed to compare the incidence of nursing related complications in patients undergoing coronary intervention through either the radial or femoral artery and to analyze the advantages and disadvantages of the two nursing approaches.*
METHODS: *Between September 2012 and June 2017, 360 patients underwent coronary intervention in radiology department and were enrolled in this study, 196 of these patients being assigned to the radial artery group and 164 of them to the femoral artery group. The postoperative adverse reactions and complications in these two groups were observed and recorded, and the results of the two groups were compared using a chi-square test and logistic regression.*
RESULTS: *The incidences of limb pain, restlessness and insomnia, low back pain, urine retention, bleeding and subcutaneous hematoma were significantly lower in the radial artery group than in the femoral artery group, but the rate of shifting approach or giving-up intervention due to artery spasm or deformity was significantly higher than that in the femoral artery group. However, the differences in the incidence of aneurysms and compartment syndrome between the two groups were not statistically significant.*
CONCLUSIONS: *Compared with the femoral artery approach, the radial artery approach results in less trauma, fewer complications, and shorter bed rest time. It also puts less psychological pressure on patients, and is more easily accepted by them. Finally, it means simpler nursing, and, thus, it should be widely promoted.*

KEY WORDS: Complications, Coronary intervention, Femoral artery, Nursing, Radial artery

Introduction

China is gradually turning into an aging society. As the most common chronic diseases in the elderly, cardiovascular and cerebrovascular diseases not only have a high incidence, but also high mortality and disability rates, and they have now become the top priority of public medical prevention and treatment in China [1].

Accordingly, coronary intervention has become the most important means of diagnosis and treatment of coronary heart disease [2]. With the ongoing emphasis on the subjective feelings of patients, the unceasing development and progress of medical technology, the steady improvement of medical equipment technology, and the continual optimization of coronary angiography and percutaneous coronary intervention (PCI), the realization of a variety of puncture approaches is constantly improving the comfort of the patients' medical experience [3]. At present, the radial artery and femoral artery are the most commonly used approaches in clinical practice [4]. Although it has been proven that in an experienced heart center, due to the continuous progress of technology, there is no significant difference in the therapeutic effect and surgical success rate between the two approaches, the different physiological structure of the puncture site, means that the complications and adverse reactions after

Pervenuto in Redazione Febbraio 2021. Accettato per la pubblicazione Aprile 2021
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intervention are still different [5]. Understanding these issues is the key to improving the quality of clinical nursing. The femoral artery approach is easy to operate. However, patients adopting this approach have longer limb immobilization time, usually develop lower back pain, insomnia, subcutaneous hematoma, and other discomforts [6]. As technology has gradually improved, intervention is now more often carried out through the radial artery, meaning that patients can get out of bed after the operation without being immobilized and experience less trauma and greater comfort [7].

The cardiac center catheter room team of our hospital is one of the earliest departments to have carried out coronary intervention in China, and, thus, it has accumulated a large number of cases and experience in both the femoral and radial artery approaches. In this study, the advantages and disadvantages of each approach was analyzed, and a comparison was made of the incidence of postoperative complications and adverse events between the two groups in order to provide a basis for the promotion of more effective nursing.

Information and Methods

Data of Patients

A total of 360 patients, who were hospitalized in our heart center and underwent coronary angiography between September 2012 and June 2017, were enrolled in this study. These patients were divided into the radial artery group (n=196) and the femoral artery group (n=164), according to the different catheterization approach taken. The study was conducted in accordance with the Declaration of Helsinki(as was revised in 2013). The study was approved by Ethics Committee of Beijing Chao-Yang Hospital, Capital Medical University and informed consent was taken from all the patients.

The inclusion criteria were as follows: (1) patients who had been diagnosed with coronary heart disease and needed coronary angiography; (2) patients aged 41–80 years; (3) patients whose prothrombin was normal before the operation, and whose liver turbulence during coronary angioplasty or stent implantation was 100 U/kg; (4) patients whose routine blood test showed the following results: white blood cell (WBC)≥3.0×10^9/L, absolute neutrophil count (ANC)≥1.5×10^9/L, platelet (PLT)≥90×10^9/L, and hemoglobin (Hb)≥80g/L; (5) patients whose vital organ functions were as follows: aspartate aminotransferase (AST) and alanine aminotransferase (ALT) ≤ 2.5 times the upper limit of normal value, total bilirubin ≤1.5 times the upper limit of normal value, serum creatinine ≤ 1.5 times the upper limit of normal value or creatinine clearance rate ≥60 ml/min, and with no other vital organ dysfunction; and (6) patients without human immunodeficiency virus (HIV), hepatitis C virus (HCV), or syphilis infection. The exclusion criteria were as follows: (1) patients whose cardiac function was grade IV; (2) patients with peripheral vascular diseases; (3) patients with a malignant tumor medical history; (4) patients with severe liver and kidney dysfunction; (5) patients with various active infections or systemic immune response diseases; and (6) patients with severe neurological or psychiatric diseases, including dementia or epilepsy, who could not cooperate with the researcher,.

Before the coronary intervention, the relevant examinations were carried out to exclude patients with any contraindications, and during the preoperative visit a consent form was signed.

Surgical Methods

Before the radial artery was punctured, it was necessary to check that the pulse was sound, and that an Allen test showed a positive result. The puncture site had to be in a good local condition, and during the puncturing, the lateral upper limb was naturally extended and abducted by about 30-45 degrees. The back of the hand was padded to make the back of the hand bend slightly to fully expose the puncture site. Routine disinfection was performed, surgical drapes were placed in position, and a local anesthesia with lidocaine was administered. The puncture site has to be carefully selected, but generally speaking, it is the site with the strongest pulsation of the radial artery, and the right side is preferred. After successful puncture, a sheath tube was inserted, and coronary angiography was performed with a catheter. When necessary, a guide catheter was used for coronary intervention. If repeated puncture attempts were unsuccessful, the left radial artery was selected or the femoral artery was used instead.

Using the femoral artery required that the patient could tolerate a long time in a supine position. The operation method was basically the same as for the radial artery puncture, but a Seldinger puncture was employed and a 5F or 6F sheath inserted.

Postoperative Nursing

In the radial artery group, the sheath tube could be removed immediately after the operation, a special balloon compressor was applied locally for a compression bandage, for 4–6 hours, and gas was gradually released to relieve the compression. Patients had to avoid lifting heavy objects and any flexion and extension for 24 hours after the removal of the compressor. In the femoral artery group, after removal of the sheath tube, the puncture site had to be pressed with fingers for at least 20 minutes, and if heparin had been used during the operation, the compression time was even longer. After observation of the puncture site to confirm that there was no

bleeding, an "8" shaped bandage was placed across the hip joint as a compression bandage, and covered with sandbags to compress the site for six hours. The puncture of lower limbs needs immobilization for 18–24 hours. During immobilization, the puncture site, the peripheral blood supply, the skin color of limbs and the pulse of the dorsal pedal artery were closely observed and recorded.

Evaluation Method

During the period from sheath tube extubation to discharge, the patients' chief complaints, discomfort, and postoperative complications were observed and recorded regularly. These included punctured side limb pain, the presence of restlessness, insomnia and urinary retention during immobilization, a shifting approach or giving-up intervention due to artery spasm or deformity, bleeding, subcutaneous hematoma, and osteofascial compartment syndrome. Such postoperative adverse reactions were evaluated comprehensively and systematically by experienced nurses, who had worked in our department for more than three years, to ensure the accuracy of the assessment.

Statistical Analysis

All data were statistical analyzed using SPSS21.0 software. Measurement data were expressed as mean ± standard deviation (x ± SD) and compared using a t-test. Count data were expressed as a percentage (%) and compared using a Chi-square test. Finally, the variables were corrected by logistic regression. With respect to the results of all the statistics, $P<0.05$ was considered statistically significant, and the inspection level was set at $\alpha = 0.05$.

Results

The Comparison of Baseline Data

A total of 360 patients who underwent coronary angiography were enrolled in this study. In the radial artery group (n=196), 127 patients were male and 69 patients were female, and the age of these patients was 60.3 ± 11 years old, and in the femoral artery group (n=164), 107 patients were male, and 57 were female, their age being 62.1 ± 10.2 years. An X^2-test was used for analysis. The differences in age and gender between the two groups were not statistically significant.

The Comparison of Chief Complaints and Discomfort

The chief complaints and discomfort of the two groups were statistically analyzed, as shown in (Table I). The results revealed that the incidence of limb pain, restlessness and insomnia, lower back pain, local skin damage, and urine retention were significantly lower in the radial artery group than in the femoral artery group, but the rate of shifting approach or giving-up intervention due to artery spasm or deformity was significantly higher than that in the femoral artery group ($P<0.05$), (Table I).

The Comparison of Postoperative Complications

As shown in (Table II), in terms of postoperative complications, the incidence of bleeding and subcutaneous hematoma was significantly lower in the radial artery group than in the femoral artery group ($P<0.05$), and the incidences of aneurysms and compartment syndrome

Table I - *Comparisons of chief complaint discomfort conditions between 2 groups of patients.*

Groups	Cases	Pain of punctured limb	Restlessness and insomnia	Low back pain	Local skin lesions	Urine retention	Arterial spasm and deformity
Radial artery group	196	19	23	11	15	5	13
Femoral artery group	164	52	91	87	28	112	2
p-value		p<0.05	p<0.05	p<0.05	p<0.05	p<0.05	p<0.05

Table II - *Comparisons of complications between 2 groups of patients.*

Groups	Cases	Bleeding	Subcutaneous hematoma	Aneurysm	Osteofascial compartment syndrome
Radial artery group	196	9	3	0	1
Femoral artery group	164	21	9	1	0
p-value		p<0.05	p<0.05	P 0.05	p 0.05

were lower, but the differences between the two groups were not statistically significant (P>0.05), (Table II).

Discussion

A Comparison of the Two Intervention Approaches

The present study revealed that although the radial artery group had significantly higher rates of shifting approach or giving-up intervention due to artery spasm or deformity than the femoral artery group, the adverse reactions and common postoperative complications were significantly lower in the femoral artery approach group. These results may be closely related to the physiological and anatomical characteristics of the two approaches.

The femoral artery is located in the deep part of the lower limb, together with the femoral vein and femoral nerve, and complications such as arteriovenous fistula very easily occur during puncture [8]. In addition, the femoral artery is thicker and has higher pressure than the radial artery, and the fat and muscle tissue in the groin is thick, so it is difficult to stop bleeding by compression, which means postoperative subcutaneous hemorrhage often occurs [9]. The length of bed rest and limb immobilization required after removing the sheath tube after femoral artery intervention also means that there is more likelihood of severe limb pain and numbness, dysuria and urinary retention [10].

On the other hand, the radial artery is located in the superficial part of the upper limb, and the success rate of puncture is high, so postoperative complications such as hemorrhage, hematoma and pseudoaneurysm are avoided to a great extent. The intravascular diameter, velocity, and pressure of blood flow are lower than those of the femoral artery, and so, after extubation, the puncture point can be closed with gentle pressure alone. There is no need to exert pressure or use sandbag compression, which means complications such as pain at the puncture site, hemorrhage, and subcutaneous hematoma can be avoided [11]. Furthermore, the radial artery approach does not require bed rest, avoiding the pain and urinary retention caused by lengthy bed rest in elderly patients, and also avoiding the occurrence of irritability and insomnia caused by bed rest and immobilization, which greatly alleviates the patient's discomfort [12]. In addition, it is also possible to avoid serious complications, such as thrombosis and embolism, caused by bed rest. Therefore, the radial artery method reduces the workload of postoperative nursing [13].

Nursing Requirements for the Two Approaches

The patients in the femoral artery group needed compression with an "8" bandage across the hip joint, and had to be able to tolerate lying in the supine position and side limb immobilization for 18-24 hours. They needed to be made aware of the possible adverse consequences and risks of any movement, so the nurses in charge had to ask the patient not to move on their own due to limb pain or numbness and to ask family members to help patients with defecation and passing urine in bed. During immobilization, the puncture site had to be protected during defecation and coughing, and nurses had to look out for subcutaneous hemorrhage, hematoma and other adverse events. For patients with previous dysuria who could not urinate autonomously with guidance and a hot compress, catheterization was sometimes necessary. Patients suffering lower back pain, puncture side limb pain, or irritable insomnia, were treated with understanding and compassion, and offered pain relief, and if the case was serious, it was reported to the doctor so that more effective treatment, including psychological counseling, could be offered [14].

The diameter of the radial artery itself is small, so, after the operation, it is only necessary to press the balloon to stop any bleeding. Since the compression point is limited, the compression hemostasis time is short and the effect is immediate. The main precautions for nurses to take were, therefore, asking the patient to ensure immobilization of their wrist and to avoid rotating, bending and holding heavy objects to prevent bleeding or subcutaneous hematoma.

Patients had to be encouraged to move their fingers gently, and gas could be released regularly to reduce the compression. During this period, the nurse had to check there was no acid distension or numbness to prevent artery occlusion, which can be caused by long-term compression of the blood vessels. The patients in the radial artery group did not need bed rest, but needed early out-of-bed activity. For three days after the bandage was removed, puncture, catheterization and blood pressure measurement on the puncture side had to be avoided, and for the first week, the patients had to try not to rub the puncture point with force and avoid lifting heavy objects while nurses had to ensure the site was kept dry and clean [15,16]. It is clear that the nursing required for the radial artery puncture approach is less demanding than for the femoral artery approach.

However, this study revealed that it was necessary for clinical nurses to continue routine monitoring of ECG, blood pressure, and other items after sheath tube removal, for both groups, and nurses also had to look out for any incision bleeding, and keep an eye on peripheral blood supply, acromelic skin color, skin temperature and dorsal pedal artery pulsation, as well as record the patient's consciousness, general spirit, breathing and other indicators, in case of hemorrhage, hematoma, aneurysm and osteofascial compartment syndrome.

Conclusion

Coronary artery intervention through both the femoral and radial approaches are safe and effective. However, a few patients may still develop postoperative adverse reactions and complications. The radial artery approach results in less trauma and fewer complications and adverse reactions, and postoperative comfort is high, so it is more easily accepted by patients. In addition, the nursing is less demanding. Consequently, due to its practicability and feasibility, the radial artery approach is worthy of extensive clinical popularization.

Acknowledgements

We are particularly grateful to all the people who have given us help on our article.

Riassunto

Questo studio è stato progettato per confrontare l'incidenza delle complicanze infermieristiche in pazienti sottoposti a intervento coronarico attraverso l'arteria radiale o femorale e per analizzare i vantaggi e gli svantaggi dei due approcci infermieristici.
Tra settembre 2012 e giugno 2017, 360 pazienti sono stati sottoposti a intervento coronarico nel reparto di radiologia e sono stati arruolati in questo studio; 196 di questi pazienti sono stati assegnati al gruppo arteria radiale e 164 di loro al gruppo arteria femorale. Le reazioni avverse e le complicanze postoperatorie in questi due gruppi sono state osservate e registrate e i risultati dei due gruppi sono stati confrontati utilizzando un test chi-quadrato e una regressione logistica. Risultati: L'incidenza di dolore agli arti, irrequietezza e insonnia, lombalgia, ritenzione di urina, sanguinamento ed ematoma sottocutaneo sono risultati significativamente inferiori nel gruppo arteria radiale rispetto al gruppo arteria femorale, ma il tasso di cambiamento dell'approccio o rinuncia all'intervento dovuto allo spasmo o alla deformità dell'arteria si è dimostrato significativamente più elevato di quella del gruppo dell'arteria femorale. Tuttavia, le differenze nell'incidenza di aneurismi e sindrome compartimentale tra i due gruppi non sono risultati statisticamente significative. In conclusione rispetto all'approccio dell'arteria femorale, l'approccio dell'arteria radiale si traduce in meno traumi, meno complicazioni e tempi di riposo a letto più brevi. Inoltre esercita una minore pressione psicologica sui pazienti ed è più facilmente accettato da loro. Infine, significa assistenza infermieristica più semplice e, quindi, dovrebbe essere ampiamente promossa.

References

1. Ammirati E, Moroni F, Magnoni M, et al.: *Extent and characteristics of carotid plaques and brain parenchymal loss in asymptomatic patients with no indication for revascularization*. Int J Cardiol Heart Vasc, 2020; 30:100619, 20, doi: 10.1016/j.ijcha.2020.100619.

2. Karimi Galougahi K, Patel S, Shlofmitz RA, et al.: *Calcific plaque modification by acoustic shockwaves: Intravascular lithotripsy in coronary interventions, published online,* 2020; 10: Circ Cardiovasc Interv. 2020; 10.1161/circinterventions.120.009354, doi: 10.1161/circinterventions, 120.009354.

3. Oktaviono YH, Rizal A, Al-Farabi MJ, Maghfirah I, Rachmi DA: *Coronary Angiography Characteristics as predictor of successful chronic total occlusion recanalization*. Int J Angiol, 2020; 29(3):196-201, doi: 10.1055/s-0040-1709503.

4. Saeed W, Adam M, Abdallah TA, Omrani AS: *Percutaneous coronary intervention associated actinomyces oris. ID Cases*. 2020; 22:e00929, Published 2020, doi: 10.1016/j.idcr.2020.e00929.

5. Ma LK, Yu H.: *Transradial artery puncture coronary intervention in elderly patients with acute coronary syndromes.* Chinese Journal of Interventional Cardiology, 2008; 16:38 (In Chinese).

6. Huang Y, Nong JG, Xue Q, Feng QZ, Lu CY: *The efficacy of the figure-of-eight suture technique in the treatment of tunnel bleeding of the femoral artery route after percutaneous coronary intervention or angiography.* J Int Med Res, 2020; 48(8):300060520947307, doi: 10.1177/0300060520947307.

7. Li J, Qiu H, Yan L, et al.: *Efficacy and safety of ticagrelor and clopidogrel in patients with stable coronary artery disease undergoing percutaneous coronary.* Intervention, [published online 2020], J Atheroscler Thromb, 2020; 10.5551/jat.57265, doi: 10.5551/jat.57265.

8. Gokhroo RK, Chandra K, Nandal R, et al.: *The initial experience of 2495 cases of the ulnar artery as default access for coronary diagnostic and interventional procedures at a single center: An observational study.* Indian Heart J, 2020; 72(3):184-88, doi: 10.1016/j.ihj.2020.05.010.

9. Meijers TA, Aminian A, Teeuwen K, et al.: *Complex Large-Bore Radial percutaneous coronary intervention: rationale of the color trial study protocol*. BMJ Open, 2020; 10(7):e038042, Published 2020, doi: 10.1136/bmjopen-2020-038042.

10. Semitko SP, Mel'nichenko IS, Karpeeva MI, et al.: *Vybor al'ternativnogo dostupa pri neudache éndovaskuliarnogo vmeshatel'stva cherez pravuiu radial'nuiu arteriiu [Choice of an alternative access in failed endovascular intervention through the right radial artery].* Angiol Sosud Khir, 2020; 26(2):76-83, doi: 10.33529/angio2020203.

11. Isawa T, Horie K, Honda T, Taguri M, Tada N: *Slender Sheath/Guiding catheter combination vs. sheathless guiding catheter for acute coronary syndrome: A propensity-matched analysis of the two devices,* [published correction appears in J Interv Cardiol, 2020; 22:2020; 1303764], J Interv Cardiol, 2020; 2020:8216831, Published 2020, doi: 10.1155/2020/8216831.

12. Li B, Xing YH, Cai Y, et al.: *Clinical features and care of patients with severe bleeding complications after percutaneous coronary interventions*. Journal of nursing (China), 2010; 17(5B):35-36 (In Chinese), https://kns.cnki.net/kcms/detail/detail.aspx?dbcode= CJFD &dbname=CJFD2010&filename=NFHL201010015&v=IonC907U

BYyKbMof5F7F5TBFAjQDGAZfxgtyyJCGOGaLk6ACdWA5E8lpZpzOX6jE.

13. Chen J, Tian FH, Cao Y: *Coronary angiography and interventional care via the radial and femoral arteries*. Inner Mongolia Medical Journal, 2011; 43(3):376-77, (In Chinese), https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2011&filename=NMYZ201103054&v=ejzLcIboEpEdMuR8zx0sCVapRcWQj9u17eXYmRKTAvQ7%25mmd2FAkmLgbL3Ny4W9AG8G3M.

14. Deng SJ: *Evidence-based nursing: Bandaging and hemostasis for puncture point after coronary intervention by radial artery path*. Journal of Nursing (China), 2009; 16(5A):30-32 (In Chinese), https://kns.cnki.net /kcms/detail/ detail.aspx?dbcode=CJFD&dbname= CJFD2009&filename=NFHL200909013&v=U7WmQmUz5Y5J2cABKDEcezDO4z96sUmNoFcrW8j00C2D7yeb7Kci7PW0nrMxvrUk.

15. Wang ZY: *Care for complications of coronary interventions*. Medical Journal of Wuhan University, 2010; 29(6):590-91 (In Chinese), https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFD2010&filename=YYYX201006051&v=9uUjgEWCjr5Ly%25mmd2Fy%25mmd2Beyg1OSHc9wNF6VVtdUQweXsCqNoaBKwNrbIG6y4VL8ap9Lz9.

16. Xiao L, Zhang Y: *Care strategies for post-operative complications after coronary intervention via radial artery puncture.* Chinese Journal of Modern Nursing, 2011; 17(18):2178-79. (In Chinese) https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDZHYX&filename=HLJH201118039&v=otP9yDH6tzp0HgCFj%25mmd2F0s67PCR0imV%25mmd2FjtFLXw9ZITRrkuGRoMOVIwmSEKyOGBOvN8.

Commento e Commentary

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Nonostante la piccola dimensione del campione dei pazienti arruolati nello studio, il lavoro si concentra ancora sull'importanza dell'accesso radiale nel trattamento della malattia coronarica.
In origine, l'arteria femorale era l'accesso vascolare più utilizzato per le procedure interventistiche percutanee coronariche e non coronariche. Tuttavia, l'arteria radiale è stata sempre più utilizzata come accesso vascolare perché è associata a una minore incidenza di complicanze emorragiche locali.
L'accesso radiale è ormai una routine in molti laboratori emodinamici per procedure interventistiche coronariche anche in procedure complesse come l'angioplastica primaria, il trattamento della stenosi della biforcazione, il trattamento delle occlusioni coronariche croniche e il trattamento della stenosi del bypass coronarico.
In letteratura ci sono diversi studi clinici randomizzati (RCT) che confrontano l'accesso radiale con l'accesso femorale nell'angiografia diagnostica e per l'intervento coronarico percutaneo (PCI). I due studi più grandi sono RIVAL ((accesso radiale versus femorale per angiografia coronarica e intervento in pazienti con sindromi coronariche acute) e MATRIX (minimizzazione degli eventi emorragici avversi per sito di accesso transradiale e implementazione sistemica di AngioX) [1,2].
Nello studio RIVAL, che ha arruolato 7021 pazienti, la mortalità non correlata a CABG, IM, ictus e tassi di sanguinamento maggiore sono stati considerati come esiti primari a 30 giorni e un tasso simile è stato osservato tra questi endpoint confrontando l'accesso radiale rispetto a quello femorale (HR 0,92, IC 95% 0,72-1,17, P=0,50). La conclusione di questo studio è che gli approcci radiale e femorale sono entrambi sicuri ed efficaci per PCI. Tuttavia, il minor tasso di complicanze vascolari locali può essere un motivo per utilizzare l'approccio radiale.
Nello studio MATRIX, sono stati arruolati 8404 pazienti con sindrome coronarica acuta (SCA), assegnati in modo casuale all'accesso radiale o femorale. Sebbene in termini di eventi clinici avversi maggiori non vi fosse alcuna differenza significativa tra accesso radiale e femorale (RR 0,85; IC 95% 0,74-0,99; P=0,031), il rischio di sanguinamento è aumentato a 30 giorni ed era significativamente inferiore con accesso radiale (RR 0,83; IC 95% 0,73-0,96; P=0,009). Il sanguinamento maggiore è stato significativamente ridotto nel gruppo con accesso radiale (1,6 vs 2,3%; RR 0,67, IC 95% 0,49-0,92; P=0,013) e quest'ultimo è stato anche associato a un tasso di mortalità per tutte le cause inferiore (1,6 vs 2,2%; RR 0,72, IC 95% 0,53-0,99; P=0,045).
I vantaggi offerti da questo approccio, come si può chiaramente vedere dall'articolo, sono infatti una riduzione del rischio di sanguinamento locale, una mobilizzazione più rapida, una migliore gestione infermieristica e una più facile tollerabilità da parte del paziente; per questo motivo l'arteria radiale è l'accesso di scelta nel cateterismo coronarico (Livello I, Raccomandazione Classe A; Linee guida ESC / EACTS sulla rivascolarizzazione miocardica) [3]. Tuttavia, l'accesso radiale può essere utilizzato anche per interventi vascolari non coronarici. Nel trattamento dei vasi sovraortici (carotide, succlavia o arteria vertebrale), l'accesso radiale può essere utilizzato quando sono presenti ostacoli anatomici a livello del distretto iliaco-femorale o per trattare varianti anatomiche come l'arco aortico bovino o quando l'approccio femorale non è adatto. Ci sono alcuni studi clinici randomizzati in letteratura che confrontano i diversi approcci (radiale vs femorale). I due studi principali [4,5] dimostrano ancora una volta come, anche nel trattamento delle lesioni del tronco sopraortiche, l'accesso radiale rappresenti un approccio che garantisce un alto tasso di successo procedurale associato a un ridotto rischio di mortalità e minori tassi di complicanze locali e cerebrovascolari.
Ulteriori meta-analisi saranno utili e necessarie per confermare questi dati e raccomandare l'accesso radiale anche per interventi non coronarici.

* * *

Despite the small sample size of the patients enrolled in the study, the work again focuses on the importance of radial access in the treatment of coronary artery disease.

Originally, the femoral artery was the most used vascular access for coronary and non-coronary percutaneous interventional procedures. However, the radial artery has increasingly been used as a vascular access because it is associated with a lower incidence of local bleeding complications.

Radial access is now routine in many hemodynamic laboratories for coronary interventional procedures even in complex procedures such as primary angioplasty, treatment of bifurcation stenosis, treatment of chronic coronary occlusions and treatment of coronary bypass stenosis.

In the literature there are several randomized clinical trials (RCTs) that compare radial access with femoral access in diagnostic angiography and for Percutaneus Coronary Intervention (PCI). The two largest trials are RIVAL ((Radial versus femoral access for coronary angiography and intervention in patients with acute coronary syndromes) and MATRIX (Minimizing Adverse Haemorrhagic Events by Transradial access Site and Systemic Implementation of AngioX) [1,2].

In the RIVAL study, which enrolled 7021 patients, non-CABG-related mortality, MI, stroke and major bleeding rates were considered as primary outcomes at 30 days, and a similar rate was observed between these endpoints when comparing radial access versus the femoral one (HR 0.92, 95% CI 0.72-1.17, P = 0.50). The conclusion of this study is that radial and femoral approaches are both safe and effective for PCI. However, the lower rate of local vascular complications may be a reason to use the radial approach.

In the MATRIX study, 8404 patients with acute coronary syndrome (ACS) were enrolled and were randomly assigned to radial or femoral access. Although in terms of major adverse clinical events there was no significant difference between radial and femoral access (RR 0.85; 95% CI 0.74-0.99; P = 0.031), the risk of bleeding increased at 30 days it was significantly lower with radial access (RR 0.83; 95% CI 0.73-0.96; P = 0.009). Major bleeding was significantly reduced in the radial access group (1.6 vs 2.3%; RR 0.67, 95% CI 0.49-0.92; P = 0.013) and the latter was also associated with a lower all-cause mortality rate (1.6 vs 2.2%; RR 0.72, 95% CI 0.53-0.99; P = 0.045).

The advantages offered by this approach, as can be clearly seen from the article, are in fact a reduction in the risk of local bleeding, a faster mobilization, a better nursing management and an easier tolerability by the patient; for this reason, radial artery is the access of choice in coronary catheterization (Level I, Class A Recommendation; ESC/EACTS Guidelines on myocardial revascularization) [3].

However, the radial access can also be used for non-coronary vascular intervention. In the treatment of the supra-aortic vessels (carotid, subclavian or vertebral artery), the radial access can be used when there are anatomical obstacles at the level of the iliac-femoral district or to deal with anatomical variants such as the bovine aortic arch or when the femoral approach is not suitable.

There are some randomized clinical trials in the literature that compare the different approaches (radial vs femoral). The two main studies [4,5] demonstrate once again how, even in the treatment of supraortic trunk lesions, radial access represents an approach that guarantees high procedural success rate associated with a reduced risk of mortality and lower rates of local and cerebrovascular complications.

More meta-analyzes will be useful and necessary to confirm this data and recommend radial access also for non-coronary intervention.

Bibliografia

1. Valgimigli et al.: *Matrix investigators. Radial versus femoral access in patients with acute coronary syndromes undergoing invasive management: A randomised multicentre trial*. Lancet, 2015; 385:2465-76.

2. Jolly et al.: *Rival trial group. Radial versus femoral access for coronary angiography and intervention in patients with acute coronary syndromes (RIVAL): A randomised, parallel group, multicentre trial*. Lancet, 2011; 377:1409-20.

3. Neumann et al.: *ESC/EACTS guidelines on myocardial revascularization the task force on myocardial revascularization of the european society of cardiology (ESC) and european association for cardio-thoracic surgery (EACTS)*. European Heart Journal, 2019; 40:87-165, doi: 10.1093/eurheartj/ehy394.

4. Jaroenngarmsamer et al.: *Procedural success with radial access for carotid artery stenting: systematic review and meta-analysis*. J Neurointerv Surg, 2020; 12(1):87-93, doi: 10.1136/neurintsurg-2019-014994, Epub, 2019; 14:PMID: 31201288.

5. Ruzsa et al.: *A randomised comparison of transradial and transfemoral approach for carotid artery stenting: Radcar (radial access for carotid artery stenting) study*. EuroIntervention, 2014; 10(3):381-91, doi: 10.4244/EIJV10I3A64, PMID:25042266.