

Proposed protocol illustrated for hypodermoclase

Abstract

Introduction: Hipodermoclasia is a subcutaneous puncture technique that allows the infusion of fluids and drugs, is an ancient technique that has been replaced by new methods, currently being discussed with a view to recovering its practice, and to explore its peculiarities, allowing its implementation in the face of its benefits.

Objective: To elaborate an illustrated puncture protocol in a public hospital in the interior of São Paulo. **Method:** This is a qualitative, exploratory and descriptive research, in order to obtain the images of the technique and its respective puncture sites, in order to develop an illustrated protocol. It was performed in the palliative care sector, with randomly selected patients, not considering their respective diagnoses and / or time of hospitalization.

Result: Development of the illustrated protocol describing the materials used, and the technique for puncturing. Among the possible illustrated places are the regions: interscapular; subclavicular; deltoid; abdominal and anterolateral aspects of the thigh.

Conclusion: It was possible to develop a facilitating and enlightening tool in the accomplishment of the hipodermoclasia technique, in a safe and objective way, providing a global view of this nursing assistance, being possible to align its execution form, visually and didactic

Keywords: hipodermoclasia, subcutaneous, medication, palliative, protocol, nursing

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Introduction

Hypodermoclase is a method of fluid replacement and administration of drugs by subcutaneous (SC), its use is more frequent in palliative patients, children and elderly, it is still an indicated alternative for patients in terminal phase.¹ The subcutaneous tissue is endowed with blood capillaries becoming a conduit conducive to the administration of fluids and such drugs, once they are absorbed and transported the microcirculation. The vascularization of subcutaneous tissue accounts for approximately 6% of cardiac output, allowing a rate of absorption very similar to that of intramuscular administration of drugs reaching lower serum concentrations, but with prolonged action time similar to other parenteral methods it avoids Clearance and Pre-systemic by the liver, allowing a stable serum concentration of the drug and avoiding plasma peaks that determine the possible appearance of undesirable side effects, if continuous infusion is used, it is also avoided that the plasma concentration falls to insufficient levels for resurgence of symptoms.²

Most of the isotonic solutions infused by intravenous therapy can be replaced by hipodermoclasia, with the most applied ones being sodium isotonic with and without glucose, as well as non-vesicant electrolyte solutions with and without lactate, can also be infused. Likewise, various medications may be administered, for example: Morphine, Tramadol, Fentanyl, Insulins, Haloperidol, Cyclizine, Metoclopramide, Midazolam, Phenobarbital, Promethazine, Hydroxyzine, Atropine, Scopolamine, Dexametazone, Ranitidine, Furosemide, among others.

The practice of using the subcutaneous route for infusion of large volumes is known worldwide, this technique has been carried out since the eighteenth century, there are reports that in the nineteenth century was used during the cholera epidemic in Europe. In 1895 in the cholera epidemic in India,³ but only in 1979 Russel described the use in cancer patients for analgesia, after publication the method began to be studied. In Brazil in the 1940s and 1950s the practice

of hipodermoclasia began to be used in pediatric patients, later with the introduction of more modern intravenous catheters, associated to reports of problems related to the misuse of the technique due to serious adverse effects, such as hypovolemic shock, administration of hypertonic solutes and glucose solutions, caused a decline in its use in the practice of care, many institutions have now rescued the use of this technique.^{4,5}

The correct use of hipodermoclasia is considered safe and a technique of choice in dehydrated and nutritional deficient patients, due to its effectiveness and ease of application, besides patient comfort, durability of access and low cost in relation to intravenous access patients with collapsed veins and fragile ones that break easily. Being principally prescribed for fluid replacement, patients with oral impairment with vomiting and diarrhea may suffer a water imbalance leading to dehydration related to loss of fluid and electrolytes, and mild to moderate dehydration in patients with antibiotics, analgesics and anti-neoplastic agents.⁶

Its great advantage is related to length of stay, which can be maintained for more than 5 days, reducing pain, with few side effects, easy handling and maintenance, as well as avoiding the discomfort of venous punctures. This method can be used in home and hospital care, has the benefit of preservation and manipulation, low cost, can be interrupted and restarted at any time, low infection rates, reduced risk of cardiac overload and shorter hospitalization time, good acceptance by relatives and does not require immobilization of the limb, providing more autonomy to the patient.⁷

Although the use of the technique in palliative patients is more common, hipodermoclasia can be used in other settings, such as in the treatment of cancer patients or in pediatric patients such as neonates, adherence to subcutaneous drug therapy can be implemented, since patients frequently present conditions that prevent adequate maintenance of levels of hydration and nutrition.⁸ Currently the choice of technique is more widespread in elderly patients, due to

the compromised venous network caused by the decrease of body fluid, which makes it difficult to locate the vessel, the stiffening of vessels, and the fragility of the walls of the vessels, resulting in a greater probability of rupture of the vessels in the intravenous infusion. In cases where dehydration occurs and it is necessary to keep the client in continuous infusion, venous puncture should be considered as causing more discomfort, from the technique of gaining until insertion of the catheter and maintenance of the pathway, which makes the hipodermoclisis the best route for the elderly patient, as well as patients in similar conditions with fragility of blood vessels.⁹ Most patients with advanced tumors do not require large hydration fluids, since they generally have a reduction in body weight, less activity, decrease of free water clearance, therefore, hipodermoclisis therapy offers a smaller volume of solution to maintain function and avoid side effects.¹⁰

A maximum volume of 1500 ml 3,2000 ml11 infusion is found every 24 hours at each catheter insertion site in a continuous or intermittent manner, where bolus administration may be up to two ml and should be monitored and reported in In the case of phlogistic signs at the insertion site of the catheter, or complaint of discomfort, extravasation of the liquid, the absorption of the drug occurs through the hydrostatic and osmotic force thus arriving in the patient's bloodstream, the action of the infused drug has peak plasma action in around 20 minutes, is widely used in cases of prolonged use of analgesics.¹¹

The care of palliative patients has been discussed in an effort to improve care and promote well being to the patient, considering that many patients come from long and painful treatments, in this work we intend to prove that through the rescue of the technique it is possible to provide an improvement in relation even though in a timely manner, large institutions have already adhered to this practice, such as the National Cancer Institute (INCA), São Paulo infectious disease hospital Emilio Ribas, institutions with geriatric and palliative wings, as we mentioned among the risks and benefits the technique offers many benefits in general.^{12,13}

Considering the plurality of criteria for the use of hipodermoclisis, it is noticed that there is a lack of studies that explore and expand the possibilities of using the technique in neonates and pediatric as mentioned previously in the discovery of the procedure, through the research we observed that the subject is little approached in bibliographies and studies, considering that the work of the nursing team is extremely broad in what refers to the administration of medications is largely the competence of the nursing team, therefore there is a need to broaden the discussion about the technique, explore its peculiarities and publish findings important for a better understanding of the hipodermoclisis issue.¹⁴

Goal

Elaborate protocol with delimitation and illustrated description of sites and puncture techniques for hipodermoclisis

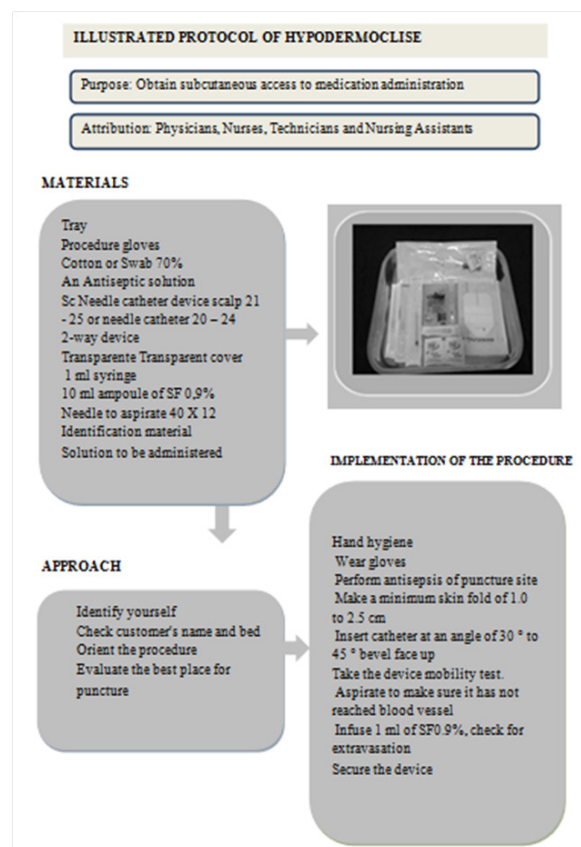
Method

A qualitative, exploratory and descriptive study was carried out in a public hospital, a philanthropic institution located in the interior of São Paulo, in the municipality of Jundiaí. The Hospital of Charity Saint Vincent de Paul came through a Catholic movement, which in 1897 held a conference with the intention of developing works, to help the poor and practice charity, according to the need encountered by the group in serving the population his objectives were expanded and redirected on December 20, 1902.

It is currently a reference hospital, which serves a region of around 800 thousand people, from Jundiaí and region, with around 20 thousand visits per month, with approximately eight care programs developed in various clinical specialties. In the palliative care sector of the hospital, there is a registry of 188 patients that aggregates those with some progressive or incurable disease, such as cancer, dementia, multiple sclerosis, receiving guidelines and specialized care. The sector is composed of a multidisciplinary team with the proposal to attend the patient in its physical, psychological and social aspect.

A technical visit was made to the nurse responsible for the sector and the methodology of the research, which would be recorded, using as a tool a Kodak® Easy Share C1013 digital camera with 10.3 mega pixels, which does not have an integrated system with internet or any media, only memory card, handled by the researchers, it did a schedule to start the search. Regarding the procedure for data collection: puncture procedure was followed for hipodermoclisis in patients of the sector, selecting patients with indication for technique, where the puncture sites were evidenced and recorded. Both were photographed with the consent of the patient, about the care of not identifying the patient and the nursing professional at the time of the records.

Sufficient patients were selected until the possible evidence of all puncture sites. Thus, aiming at the comfort of the patient, the dependency of the accepted ones after the explanations about the research and attendance to the objective, the research was carried out in October 2017, being necessary 3 periodic visits, once a week, with permanence of 2 hours per day for recording puncture sites. They were part of the collection of informed patients that accepted to participate in the research, after all the orientation and explanation of the same, clarifications of doubts and signing of the Term of Free and Informed Consent (TCLE).



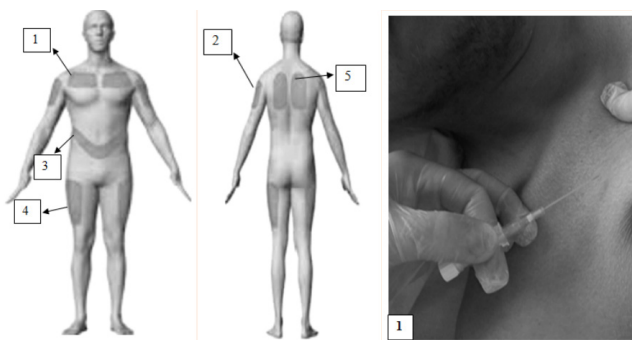


Figure 1 N=57; Epidemiological distribution of the pathological fractures, traumatic fractures, and nonunion.



Figure 2 Deltoid region.

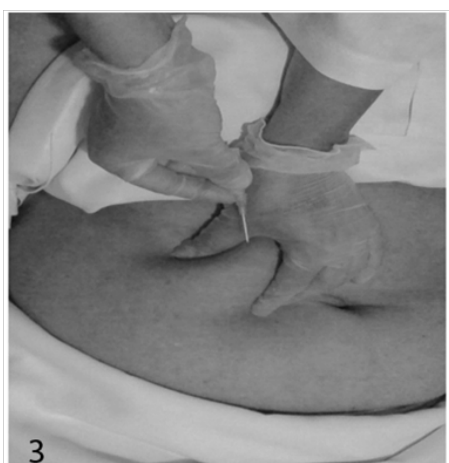


Figure 3 Abdominal region.¹⁶

Three patients were chosen independently of the genus, at the suggestion of the nurse responsible for the palliative care sector, not having the diagnosis, hospitalization time, history or any other patient data as a criterion. The professional who performed the puncture was a nursing technique, under the supervision of the nurse who evaluated the puncture site. The work was approved by the Ethics Committee

of the Campo Limpo Paulista School and registered under number 2,299,366.

Result

Figures

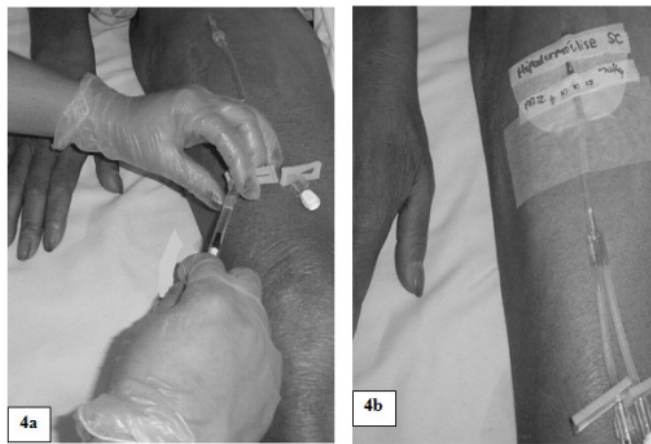


Figure 4 Anterolateral thigh region.



Figure 5 Interscapular region.

Table 1 Compatibility of medicinal products. Jundiaí / SP

Medications	Cefepime	Ceftriaxone	Dipyrrone	Scopolamine	Furosemide	Haloperidol	Levomopromazine	Metoclopramide	Midazolam	Morphine	Octreotide	Ondansetron	Ranitidine	Tramadol	Dexamethasone
Cefepime															
Ceftriaxone															
Dipyrrone															
Scopolamine															
Furosemide															
Haloperidol															
Levomopromazine															
Metoclopramide															
Midazolam															
Morphine															
Octreotide															
Ondansetron															
Ranitidine															
Tramadol															
Dexamethasone															

☐ Compatible
 ■ Incompatível

Source: Handbook of Hypodermoclaste¹⁶ adapted.

Next the relation of the exclusive site, with their respective diluents and time of infusion:

Medicines	Dilute	Remark
Cetorolaco	SF 0,9%	Exclusive way
Dexametasona		Slow application, exclusive
Fenobarbital	SF 0,9%	Infusion 40 minutes, exclusive
Octreotida	SF 0,9%	Exclusive way
Medicines	Dilute	Remark
Clonazepam	SF 0,9% ou AD	Dilute to the maximum tolerated
Levomepromazina	SF 0,9 %	Dilute to the maximum tolerated
Metadona	SF 0,9 %	Change site every 24 hours
Metoclopramida	SF 0,9 %	Dilute the maximum tolerated
Midazolam	SF 0,9 %	Dilute the maximum tolerated
Morfina	SF 0,9 %	Dilute the maximum tolerated
Medicines	Dilute	Remark
Ampicilina	SF 0,9%	Infusion 20 minutes
Atropina		
Cefepima	SF 0,9%	Infusion 40 minutes
Cefotaxima	SF 0,9%	Infusion 30 minutes
Ceftazidima	SF 0,9%	Infusion 30 minutes
Ceftriaxona	SF 0,9%	Infusion 40 minutes
Ciclizina	AD	Incompatible with SF
Diclofenaco	SF 0,9%	May cause local irritation
Dimenidrato	SF 0,9%	
Dipirona	SF 0,9%	Slow bolus application
Ertapenem	SF 0,9%	Infusion 30 minutes
Escopolamina	SF 0,9%	
Famotidina		
Fentanil	SF 0,9%	
Furosemda	SF 0,9 %	Bolus or Infusion Pump
Granisetrona	SF 0,9%	Infusion at least 10 minutes
Haloperidol	SF 0,9% ou AD	if> 1mg / ml use AD at dilution
Hidromorfa		
Hidroxizina		
Maropenem	SF 0,9%	Infusion 40-60 minutes
Naproxeno		Incompatible with Morphine
Olanzapina		
Ondansetrona	SF 0,9%	Infusion 30 minutes
Omeprazol	SF 0,9%	Incompatible with other medicines
Prometazina		
Ranitidina	SF 0,9%	
Sumatriptana	SF 0,9%	
Topramicina		
Tramadol	SF 0,9%	

Source: Handbook of Hipodermoclisis 16 Adapted.

Discussion

The results found in the study showed that puncture for hipodermoclisis has been used as an alternative method in the treatment of palliative care, patients with nutritional and dehydrated deficits, due to their current state of health, it is impracticable to administer the medication orally, on many occasions the venous network becomes fragile, making venous access difficult or difficult. Hipodermoclisis is indicated because besides being a safe technique with few side effects, in relation to other infusion routes it is easy to perform, low cost, good acceptance by the family, effectiveness in the functionality and also promotes humanized care, through comfort and relief to patient.^{2,3,6}

Studies have shown that there are divergences with the technique, while some publications mention that it should follow infusion

time criteria, such as 1 ml per minute totaling 60 ml/hour.^{4,15} Other publications mention infusion of 80 to 100 ml/hour.¹¹ While the agency of the Regional Council of Nursing of São Paulo (Coren-SP) recommends the exchange in 72 hours, in relation to the time indicated for exchange of access. caliber of catheter. Likewise, the body defines that a 23-25 gauge scalp should be used while the same recommendation is not found in other articles 4, 6. As to the positioning of the catheter, it is possible to find recommendations for performing a 180° rotation of the catheter after punch, causing the bevel to be facing down.^{7,13} Such information is not mentioned in most publications. In view of the respective findings, it becomes evident the need to align the technique, it shows the importance of the construction of protocols to standardize the nursing care, it enables a safe and effective assistance in the exercise of the function.

Among the main difficulties related to the execution of the technique, during the research it was possible to observe that, although the technique was performed more than 5 years in the institution, it is not all the professionals in the sector that are qualified to carry it out, being delegated to those trained. It is noticed that there is difficulty and lack of knowledge of the professionals regarding the possibilities of puncture site, being more common the puncture in anterolateral region of the thigh, realizing only rodizio between the two limbs, even when there is indication of puncturing another site. In view of the possible difficulties, the illustrated protocol becomes an important tool for the routine of the sector, being possible to obtain a clear and objective perception in the realization of the technique, within the range of its possibilities.

Regarding nursing care, being extremely important for the outcome of the treatment during the infusion are: evaluation of the puncture site in the first 4 hours every 1 hour; integrity of the skin; phlogistic signs (pain, redness, heat and edema); signs of infection; fever and bruising.³ Although the subcutaneous route is a safe technique, it is necessary to follow some general recommendations such as: to consider the volume allowed for the site and time of infusion. Fluid replacement should follow criteria for its concentration, with isotonic fluid being allowed glucose 0.5% serum and hypertonic fluid SF 0.9%.¹⁶

The volume to be infused must follow the medical prescription, respecting the maximum limit according to the regions: subclavicular and deltoid 250 ml/24 hours; interscapular and abdominal 1000 ml/24 hours, anterolateral thigh 1500 ml/24 hours. It will be up to the professional to evaluate the caliber of the catheter according to the volume, and it is necessary to evaluate the nutritional status of the client.⁶ It is recommended not to perform puncture in places with little adipose tissue; to consider how compatible medications the route and drug interaction, taking into consideration factors of combination of other substances and reaction that can bring to the patient.^{13,14,16}

See the tables below for medications and their compatibility.

Subcutaneous administration of fluids, termed hypodermoclysis, offers an alternative method for rehydrating patients, and it is beginning to gain favor among practitioners in the long-term care setting because of its ease of use and minimal risk of side effects.¹⁷ The administration of the medicament still follows the intravenous use line, since until now, the most correct form for the preparation and administration to the patients has not been established; There are recommendations, for example, of 100% dilution, ie if the medication has 1 ml dilute with 1 ml of diluent.¹⁸

However, this information is not yet a consensus for the use of all prescribed drugs, since each has its own profile in relation to dilution, stability and pH. Important facts to prevent adverse events.¹⁹ This makes the procedure considered safe and effective with considerable risks. A large part of the adverse reactions that occur may relate, for example, to puncture sites and medications that are unsuitable for the chosen route of administration, inadequate dilution and lack of rotation of the puncture site that can be considered every 96 hours.²⁰ Of the drugs already indicated and commonly prescribed for the subcutaneous route, the majority is prescribed mainly based on the clinical practice. And literature is not always considered.²¹ Therefore, we should evaluate the conditions of the patients before indicating this route of administration.^{22,23}

Thus, the illustrated and literature-based protocol with relevant information on medications, dilutions and pathways may be crucial for dissemination of the correct technique. In addition it can reflect

the potential to help reduce the \$1 billion annual US cost of avoidable hospitalizations for dehydration.²⁴

Conclusion

In relation to the objective of the research, it was possible to record the images of puncture sites, to demonstrate the sequence in which the technique should be performed, from the selection of materials; professional approach to the client; puncture and functionality tests of the access, directing its form of execution. It is possible to develop the elaboration of the illustrated protocol, facilitating the understanding of the possibilities of sites of the sites, in the following regions: subclavicular, deltoidea, abdominal, anterolateral of the thigh and interscapular. Thus allowing the visualization of the technique, favoring the material and angulation for puncture. In addition to describing the important nursing care to be considered, such as: choice of materials, caliber of devices, test for puncture effectiveness, infusion functionality, monitoring after puncture, among others.

It is important to emphasize the importance of broadening the discussion and conducting studies on hipodermoclysis, mainly to carry out studies that show the main difficulties encountered by the nursing team, in order to align the execution of the technique.

Acknowledgments

None.

Conflicts of interest

The authors declare no Conflicts of interest.

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