EXCEPTIONAL USE OF INFERIOR EPIGASTRIC VEINS IN INFANT ANESTHESIA WITH IMPRACTICAL VENOUS ACCESS

Uso excepcional da veia epigástrica inferior na anestesia de lactente com acesso venoso impraticável

Uso excepcional de la vena epigástrica inferior en la anestesia de lactante con acceso venoso impracticable

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ABSTRACT: Objective: To report an exceptional venous access situation for anesthesia by cannulation (at the surgical site) of the inferior epigastric vein. **Method:** This article reports on the experience obtained in a maternal and children hospital in the city of Guarulhos, São Paulo. **Result:** We report the case of an eight-month patient who underwent left inguinal hernia repair after incarceration episodes of difficult reduction. After routine monitoring and inhalational anesthetic induction, we obtained no venous access due to excessive adipose panicle, even with numerous attempts by several professionals. Venous access was obtained at the surgical site by dissection and catheterization of the inferior epigastric vein with a Jelco® catheter. C**onclusion:** In special cases, the inferior epigastric vein is a possible catheterization vessel for venous infusions. It is an exception procedure that requires evaluation of the child's condition, preparation for the procedure and constant monitoring by all professionals involved in the care during the perioperative period.
Keywords: Catheters. Surgical procedures, operative. Patient care team.

RESUMO: Objetivo: Relatar uma condição excepcional de aceso venoso para anestesia por meio da canulação, no campo cirúrgico, da veia epigástrica inferior. **Método:** Relato de experiência ocorrida em hospital materno-infantil do município de Guarulhos, em São Paulo. **Resultado:** Relata-se o caso de um paciente de oito meses, submetido ao procedimento de correção de hérnia inguinal esquerda após episódios de encarceramento de difícil redução. Após monitoração de rotina e indução anestésica inalatória, não se conseguiu acesso venoso, mesmo com inúmeras tentativas realizadas por vários profissionais presentes decorrente do excesso de panículo adiposo. Realizado acesso venoso no campo cirúrgico por dissecção e cateterismo com Jelco® da veia epigástrica inferior. **Conclusão:** Em casos especiais, a veia epigástrica inferior é um vaso passível de cateterização para infusões venosas. É um procedimento de exceção que requer avaliação das condições da criança, preparo para o procedimento e monitorização constante, por todos os profissionais envolvidos na assistência, no período perioperatório.
Palavras-chave: Cateteres. Procedimentos cirúrgicos operatórios. Equipe de assistência ao paciente.

RESUMEN: Objetivo: Relatar una condición excepcional de acceso venoso para anestesia por medio de la canulación, en el campo quirúrgico, de la vena epigástrica inferior. **Método:** Relato de experiencia ocurrida en hospital materno-infantil del municipio de Guarulhos, en São Paulo. **Resultado:** Se relata el caso de un paciente de ocho meses, sometido al procedimiento de corrección de hernia inguinal izquierda tras episodios de encarcelamiento de difícil reducción. Tras monitoreo de rutina e inducción anestésica inhalatoria, no se consiguió acceso venoso, mismo con innumerables tentativas realizadas por varios profesionales presentes decurrente del exceso de panículo adiposo. Realizado acceso venoso en el campo quirúrgico por disección y cateterismo con Jelco® de la vena epigástrica inferior. **Conclusión:** En casos especiales, la vena epigástrica inferior es un vaso pasible de cateterización para infusiones venosas. Es un procedimiento de excepción que requiere evaluación de las condiciones del niño, preparo para el procedimiento y monitorización constante, por todos los profesionales involucrados en la asistencia, en el período perioperatorio.
Palabras clave: Catéteres. Procedimientos quirúrgicos operativos. Grupo de atención al paciente.

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INTRODUCTION

In anesthetic procedures in general, and especially in pediatric anesthesia, reliable venous access is required so that the anesthetic act unfolds safely, which is usually obtained by implanting the access device in the peripheral venous system by puncture. Venipuncture can be particularly laborious and difficult in infants, due to their natural agitation, lack of collaboration and poorly visible veins, which can be masked by excessive adipose tissue.

It is common in pediatric surgery to induce anesthesia with *halogenated* inhalational *anesthetics*. The venous access is then reached with the child in an anesthetic state.

Several superficial veins are available for peripheral access in the upper and lower limbs and neck. Strategies for better visualization include the use of tourniquets and application of heat, avoiding surgery rooms with inadequate temperature. Although the use devices that facilitate venipuncture is also advisable, they are rarely available in Brazilian hospitals. Some examples are: Vein Locator-Universal (which transilluminates the hand, highlighting the venous vasculature), AV-300 (which uses infrared radiation), Vein Viewer (which uses near-infrared radiation to detect the presence of hemoglobin), as well as ultrasound devices designed to guide vascular access procedures by puncture.

Research shows that the number of failures in venous access increases when the first puncture is not successful, to the point of suggesting that, after the third attempt, the professional or the access method should be changed.[1]

It is not infrequent that the first attempt of venous access in a eutrophic infant after anesthetic induction is not successful. This procedure often lasts for more than half an hour with several professionals taking turns on the attempt to access the vein.

In Brazil, peripheral venous puncture is routinely performed by both nursing assistants or certified nurses.[2] However, the medical team must also have technical training to perform venous or arterial vascular accesses, but with a greater responsibility, since surgical procedures may be required.[3]

This article aimed to report an exceptional situation in which, after anesthetic induction, the vascular access to anesthesia was maintained after cannulation of the inferior epigastric vein at the surgical site.

METHOD

We report the experience obtained in a maternal and children hospital in the city of Guarulhos, state of São Paulo, Brazil, in September 2016. ABC, an 8-month-old patient was scheduled to undergo left inguinal herniorrhaphy after hernia incarceration episodes of difficult reduction. His general condition, preoperative examinations and preanesthetic evaluation were normal.

After routine monitoring and anesthetic induction with sevoflurane, vascular access was not achieved, even after numerous attempts by several professionals — including the surgeon and nurses of the Surgical Center — due to excessive adipose panicle. Intraosseous access was considered, but there was no adequate material to perform the procedure.

Considering the real need to perform the surgical procedure due to the incarcerations that had already occurred, the anesthesiologist suggested the passage of a central venous catheter inserted by puncture to perform anesthesia. Because the surgery is performed with an incision in the inferior inguinal fold, we discussed the possibility of rapidly dissecting and cannulating the inferior epigastric vein — a constant vessel whose caliber normally accepts a thin caliber catheter — in the herniorrhaphy surgical site.

Once this approach was agreed, the patient was placed in an inguinal herniorrhaphy position supported by a gluteal cushion for the usual transverse incision in the inferior abdominal fold. We carefully dissected the inferior epigastric vein in the surgical site, which normally perpendicularly crosses the operative field. This procedure was performed without difficulty.

Despite the small caliber of the vein, its catheterization with Jelco® 22 was not a challenge. Then, a sterile infusion set was installed and administered a glucose solution to maintain venous access (Figure 1). The anesthesiologist was then able to inject anesthetics, to intubate the patient and to maintain the anesthetic level without difficulty.

The surgery was performed without abnormalities, allowing the correction of the massive indirect inguinal hernia. After the surgical procedure, we removed the Jelco® catheter, attached the epigastric vein and closed the skin after local ropivacaine injection (Figure 2).

Anesthesia recovery occurred uneventfully, allowing the child to be discharged three hours after the end of the procedure.

DISCUSSION

In pediatrics, peripheral venous access failure is reported in up to 5% of cases worldwide.[1] In Brazil, a study carried out

in a pediatric unit reports that failures can reach up to 11% of procedures.[4] The literature provides us with indexes to predict peripheral venous access difficulty. Therefore, for these presumably more difficult patients, it is justifiable to select a more experienced professional to perform the puncture, since it has been proved that individual expertise is a success factor in the attempts.[5]

In pediatric anesthesia, especially among well-nourished infants, peripheral venous access is not always easy, with puncture access failure reported in 10% of cases.[6] In addition, in Brazil, it is mandatory that anesthesia be performed with a vascular access installed for safety reasons, with reports of deaths and criminal proceedings resulting from the lack of venoclysis during the surgical procedure.[7]

Figure 1. Jelco® catheter fixed in the inferior epigastric vein accessed through the herniorraphy incision.

Figure 2. Surgical site at the end of the procedure.

Under these circumstances, an intraosseous vascular access would be acceptable,[3,6] which was not attempted in our case because of the lack of adequate material, a common fact in Brazilian hospitals due to the lack of familiarity with this type of vascular access.

Although the passage of a central catheter would be an option, it is a more invasive procedure with a risk of complications from 1-3%[8] with 35% of access failures.

The inferior epigastric vessels are constant in human anatomy, draining blood into the saphenous vein system and communicating cranially with the superior epigastric veins, making accessory communication between the superior and inferior vena cava systems.

There are no reported cases, exceptionally, of the use of the inferior epigastric vein for venous infusion. Since inferior epigastric vessels can be used as vascular pedicles for microsurgery grafts, there are reports of cannulation of the inferior epigastric vein in these grafts in cases of venous thrombosis until venous drainage recovery.[10] Catheterization of the inferior epigastric vein is not a challenge for a surgeon familiar with the cannulation of the facial vein in newborns.

Performing peripheral venous catheterization with knowledge and ability is part of the scope of practice for nurses, since this procedure represents approximately 80% of their activities.[11] However, when vascular access has to be performed by other routes and by a medical staff, it is the team's responsibility to promote safe conditions for the success of the procedure, which includes provision of appropriate devices, preparing the patient for surgery, prevention of complications and child-specific care for anesthesia recovery.[12]

In the present case, the use of the inferior epigastric vein made it possible to perform safe anesthesia, with reliable venous access without involving a procedure that is more risky or harmful to the patient.

CONCLUSION

In special cases, the inferior epigastric vein is a possible catheterization vessel for venous infusions and, like others, requires assessment of the child's condition, preparation for the procedure and constant monitoring by all professionals involved in the care during the perioperative period.

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