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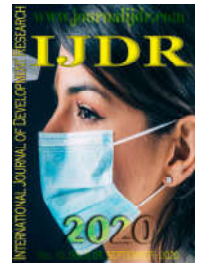
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RESEARCH ARTICLE

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CLINICAL CASE-INTRACARDIAC STRANGE BODY APPROACH IN PREMATURES AND CHILDREN - CASE REPORT

Georgio Moraes Costa¹, Cristiano Silva Neves¹, Lourdes de Fátima Gonçalves Gomes¹, João Ribeiro de Mattos Neto¹, Vilmar Jose Pereira¹, Guilherme Silva de Mendonça^{*2}

¹Universidade Federal de Uberlândia, Departamento de Pediatria, Av. Pará, 1720 – Campus Umuarama, Uberlândia, Minas Gerais, Brasil, CEP 38405-320

²Hospital de Clínicas da Universidade Federal de Uberlândia. Av. Pará, 1720 – Campus Umuarama, Uberlândia, Minas Gerais, Brasil, CEP 38405-320

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*Corresponding author:

Guilherme Silva de Mendonça,

ABSTRACT

As a universal clinical practice, central venous catheterization involves risks and raises many doubts in the patient's approach to complications, especially in the intravascular and intracardiac rupture of the catheters. Catheter rupture and embolization are the most feared, high-risk adverse events for the patient and stressful for family members and professionals involved. Even following the protocols correctly in handling the catheter, the indication of withdrawal does not prevent these complications. In this way we report the clinical and interventional experience with low weight child with rupture and intracardiac embolization of a large catheter fragment and we discuss the clinical approach in these cases and what is the best moment of withdrawal of these devices.

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INTRODUCTION

Central venous catheterization is a common practice in pediatric, neonatal intensive care units and is increasing in other areas of care from the patient to the emergency room¹. Central venous catheters provide safe, less invasive, but high-risk vascular access for adverse events¹. An adverse event is defined as unintentional injury resulting in temporary or permanent disability and even prolonging the time of illness, in the hospital, and death of the patient as a result of the treatment provided². Peripheral Insertion Central Catheter (PICC) facility is indicated by providing safe, fast, effective, improve survival and reduce sequel, mainly venous dissection and thrombosis³. Catheter rupture and intravascular embolization account for about 1% of complications associated with central venous access. These events can occur with significant mortality rates⁴. In addition, the technical refinement of the intravascular devices allowed its installation

even for children of extremely low weight (less than 1 kg) and stimulates the greater qualification of the professionals involved in the treatment of the child³. The decision about insertion of central catheter involves balancing risks and benefits where the benefits must overcome the risks³. Thus, continuous monitoring and the search for adverse effects are part of the quality therapeutic indicators and become a fundamental tool because they point out the quality of care and ensure safe care⁵. Once, correctly inserted, and positioned, PICC rupture is the most feared and risky adverse event. Catheter rupture is almost always multifactorial, but inadequate manipulation of the catheter, infusion with great intraluminal pressure, and poor technical quality of the material at the site of the puncture are among the most important determinants⁶. Thus, percutaneous insertion catheter ruptures (PICC) occur most commonly when they are introduced by access into the subclavian vein, resulting from compression of the catheter by the clavicle and the first rib,

known as pinch-off syndrome⁷. Radiography is still the method of excellence in checking the position of the catheter tip as it is accessible, inexpensive, quick, safe and feasible in any hospital unit soon after insertion and during its stay and in the detection of complications. But the immediate approach and follow-up of these patients is what most generates discomforts and doubts for the teams involved. Thus the objective of the report is to document the clinical and interventional experience with low weight child, review of the literature on the events of catheter rupture and to discuss the best moment of withdrawal of these devices.

Case Report

Patient MLGC, twin III, birth weight: 865g, female, 3 months and 21 days, hospitalized for 29 days, due to extreme prematurity (gestational age: 27 weeks), hydrocephalus after intracranial hypertension, was submitted to PICC implantation in the right saphenous vein for infusion of drugs and fluids 06 days before the event. At 29 days of hospitalization and the 6th day of PICC, on 04/28/2019, PICC rupture related to clearing occurred. The radiograph showed the fragment of the catheter with its proximal part intracardiac and the distal part in the right femoral vein. The catheter fragment was large, about 20 cm x 1.9 mm. Because it is of great extent and caliber less than 60% of the lumen of the vessels, the risk of thromboembolic and obstructive complications of the vessel was very small. Therefore, other access for medication and fluids were obtained. The patient remained without abnormalities and was clinically stable.



Figure 1. Radiograph



Figure 2. Catheterization

After four days the infant was submitted to interventional catheterization for removal of the foreign body. It was observed by the image that the catheter was in part on the right atrium and part on the right ventricular outflow tract without repercussion. Right femoral vein puncture, 5F introducer passage, insertion of Teflon guidewire was made until the right atrium and with the Judkins catheter the PICC ruptured was moved to the inferior vena cava and the tie catheter was advanced, laced the foreign body and externalized all fragments through by the femoral vein without intercurrences. In the end of the procedure, devices were removed and compressive dressing performed. The procedure was performed with infant intubated with orotracheal cannula number 3 and sedation with midazolam (0.05mg / kg), fentanyl (0.05mg / kg) and ketamine (0.05mg / kg) and mechanical ventilation: respiration rate (45), PEEP (5), inspiration pressure (18), inspiration time (0.45), Fio2 (40%) and peripheral venous access in the right axillary vein.



Figure 3. Loop catheter used for extraction

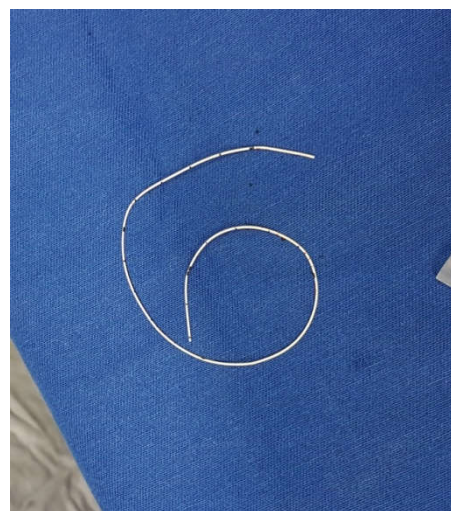


Figure 4. Ruptured PICC catheter (20 cm x 1.9 mm) after extraction

DISCUSSION

It is a worldwide consensus that central venous access devices are essential for the management of critical patients in both intensive care units and inpatient units.¹ Adverse events occur whenever there is inadequate handling. The first care should be made to sure that the tip is properly positioned to avoid perforations of the heart and pericardium avoiding the formation of pleural and pericardial effusions. The second care

is in handling and avoiding extrapolation of the imposed forces, devices of poor technical quality, in addition to the disease and the vascular anatomy of the patient⁶⁻⁹. To avoid catheter rupture it is necessary not to use excessive force and syringes with capacity of less than 10ml because they have infusion pressure greater than that supported by the PICC⁹⁻¹⁰. Circuit rupture may or may not be directly related to the length of stay but also to the quality of the infused solutions¹¹. The establishment of handling standards, using safe quality catheters, constant checking of catheter position, avoiding infusion of fluids under high pressure are items that should be routine. Furthermore, in preventing catheter rupture, inhibiting the formation of thrombi by means of safe heparinization with maintenance of 1 IU / ml of permeabilizing solution in these devices is indicated by reducing the risk of obstruction and thrombosis or microemboli¹².

Many of these adverse events are asymptomatic, may go unnoticed and undiagnosed. These catheters may undergo incomplete ruptures, with multiple holes in their path, and infusion with multiple leakage similar to a shower¹³. This may be an early, high-risk signal for complete catheter rupture especially during withdrawal. Once ruptured, the possibility of embolization to smaller vessels with obstruction to significant anterograde flow or intracardiac embolization, lung or even arterial circulation by the foramen ovale in the case of neonates and minor children and in patients with intracardiac shunt is great. In these cases, one should avoid handling the patient with unsuccessful attempts at intravascular removal of these foreign bodies. The immediate measure in approaching the patient is not to panic the team of professionals involved in handling the patient, to obtain other access, and to normally maintain the treatment and not attempt to remove the foreign body blindly. Removal of the foreign body should be done electively, planned and scheduled, with the patient clinically stable. Almost always when the foreign body locates in vessels of greater caliber or intracardiac the withdrawal by intervention in hemodynamics is the safest and more successful form. In some cases the surgical approach may be necessary mainly when the foreign body locates in vessels of smaller calibers. In hemodynamics some catheters are specific for removal of foreign bodies from the vascular system.

As the PICC technique popularized much, being universal, it led to the development of devices of smaller caliber more refined. In the absence of the loop catheter for fishing the foreign body there is the possibility of grasping the foreign body with loops made with wire guides of small caliber forming a hook and a loop type in withdrawal¹⁴. The possibility of serious problems after rupture and embolization of the fragment makes careful observation an excellent tool during the use of the central catheters¹⁵. Once the adverse event has occurred, monitoring the site of fragment's impaction with radiography is still the best diagnostic and control method these situations. Removal of the foreign body should be planned and scheduled electively and with the patient clinically stable¹¹. Desperate measures are more harmful to the patient than the effect of the adverse event itself. In the withdrawal of the embolized fragment, several techniques are used, but those that use the loop-type catheter are currently the most adequate⁴. On the other hand, the hemodynamicist should use the technique that is most familiar and safe. Most interventionalists have the opportunity to encounter a vascular foreign body throughout their clinical practice¹³. Although there is a significant rate of complications in case the catheter

fragment remains, the incidental finding in other imaging studies is not uncommon and is reported in 5% to 40% of the cases referred for evaluation¹³. Hence the need to increasingly think about these adverse events and track them continuously. It is very important to implement simple routines, algorithms and good conducts within the hospital units universally among those involved in the treatment. Finding and establishing conduit protocols for such events is essential. Prevent adverse events related to central venous access devices as well as measures to be followed in the occurrence of such adverse events. Remembering that the therapeutic arsenal is in constant modification, procedural increments, new techniques will always arise and reduce the frequency of adverse events is a challenge that should be the goal always.

REFERENCES

- Bienert IRC, ChiozziRLLAF, MotaCEC, BragaJS, Bombonato R, KajitLJ.(2013) Relato de caso – Remoção Percutânea de Fragmento de cateter intravascular – uma adaptação da caixa de ferramentas. *Rev Bras Cardiol Invasiva*.21(3):291-4.
- Castilla-Moreno M, Bueno-Gaona E, Fernández-Jurado M I, Zabala I. (2003) Breakage and embolization of na epicutaneous central cateter with migration of the right lobar pulmonar artery. *Rev Esp Anesthesiol Reanim*. 50(5):237-41.
- de Lorenzo-Pinto A, Sánchez-Galindo AC, Manrique-Rodriguez S, et al.(2014) Prevention and treatment of intraluminal cateter thrombosis in children hospitalised in a paediatric intensive care unit. *J Paediatr Child Health*. 50(1):40-6. doi: 10.1111/jpc.12404.Epub 2013 Oct 18.
- Franceshi AT, da Cunha MLC.(2010) Eventos adversos relacionados ao uso de cateteres venosos centrais em recém-nascidos hospitalizados. *Ver. Latino-Am. Enfermagem [online]*. 18(2):196-202.
- Hinke DH, Zandt-Stastny DA, Goodman LR, Quebbeman EJ, Krzywda EA, Andris DA. (1990) Pinch-off syndrome: a complication of implantable subclavian venous access devices. *Radiology*. 177(2). <https://doi.org/10.1148/radiology.177.2.2217768>
- Instituto Nacional do Câncer (Brasil). (2008) Procedimentos e cuidados especiais – Capítulo 8. In: *Ações de enfermagem para o controle do câncer: uma proposta de integração ensino-serviço*. 3. ed. rev. atual. ampl. Rio de Janeiro: INCA, 628 p.
- Jesus VC, Secoli SR. (2007) Complicações acerca do cateter venoso central de inserção periférica (PICC). *Ciência, Cuidado e Saúde*. 6(2):252-60.
- Martins EC, Faria GB. (2007) Percutaneous retrieval of intracardiac foreign body with a novel technique. *Arq Bras Cardiol*. 88(6):e179-81.
- Mendes W, Travassos C, Martins M, Noronha J. (2005) Revisão dos estudos de avaliação da ocorrência de eventos adversos em hospitais. *Rev Bras Epidemiol*. 8(4):393-406.
- Menon G. (2003). Neonatal Long lines. *Arch Dis Child Fetal Neonatal*. 88:F260-2.
- Nascimento CCP, Toffoletto MC, Gonçalves LA, Freitas WG, Padilha KG. (2008) Indicadores de resultados da assistência: análise dos eventos adversos durante a internação hospitalar. *Rev Latino-am Enfermagem*. 16(4):746-51.

- Phillips LD. (2001) Cateteres de acesso venoso central. In: Phillips L D. Manual de Terapia Intravenosa. Porto Alegre (RS): Artmed; p.334-72.
- Schecher MA, OBrien PJ, Cox MW. (2013) Retrieval of iatrogenic intravascular foreign bodies. *J Vasc Surg.* 51(1):276-81.
- Secretaria do Estado do Rio de Janeiro (Brasil). (2002) Rotina para cateter venoso central de inserção periférica em neonatos. Rio de Janeiro (RJ): Secretaria do Estado do Rio de Janeiro; 2002.
- Tateishi M, Tomizawa Y. (2009) Intravascular foreign bodies: danger of unretrieved fragmented medical devices. *J Artif Organs.* 12(2):80-9.
