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Introduction:

A portacath is a valuable tool for supportive care, repeated blood sampling, and therapy, especially in children with malignancies or metabolic disorders. GAVeCeLT has released an insertion bundle called SIC-Ped (Safe Insertion of Central Access in Pediatric Patients), which has been widely adopted globally. However, there are still some local concerns about following it during the insertion of TIVAD (Totally Implanted Vascular Access Device), with still popular fluoroscopy, commonly used for catheter tip location.

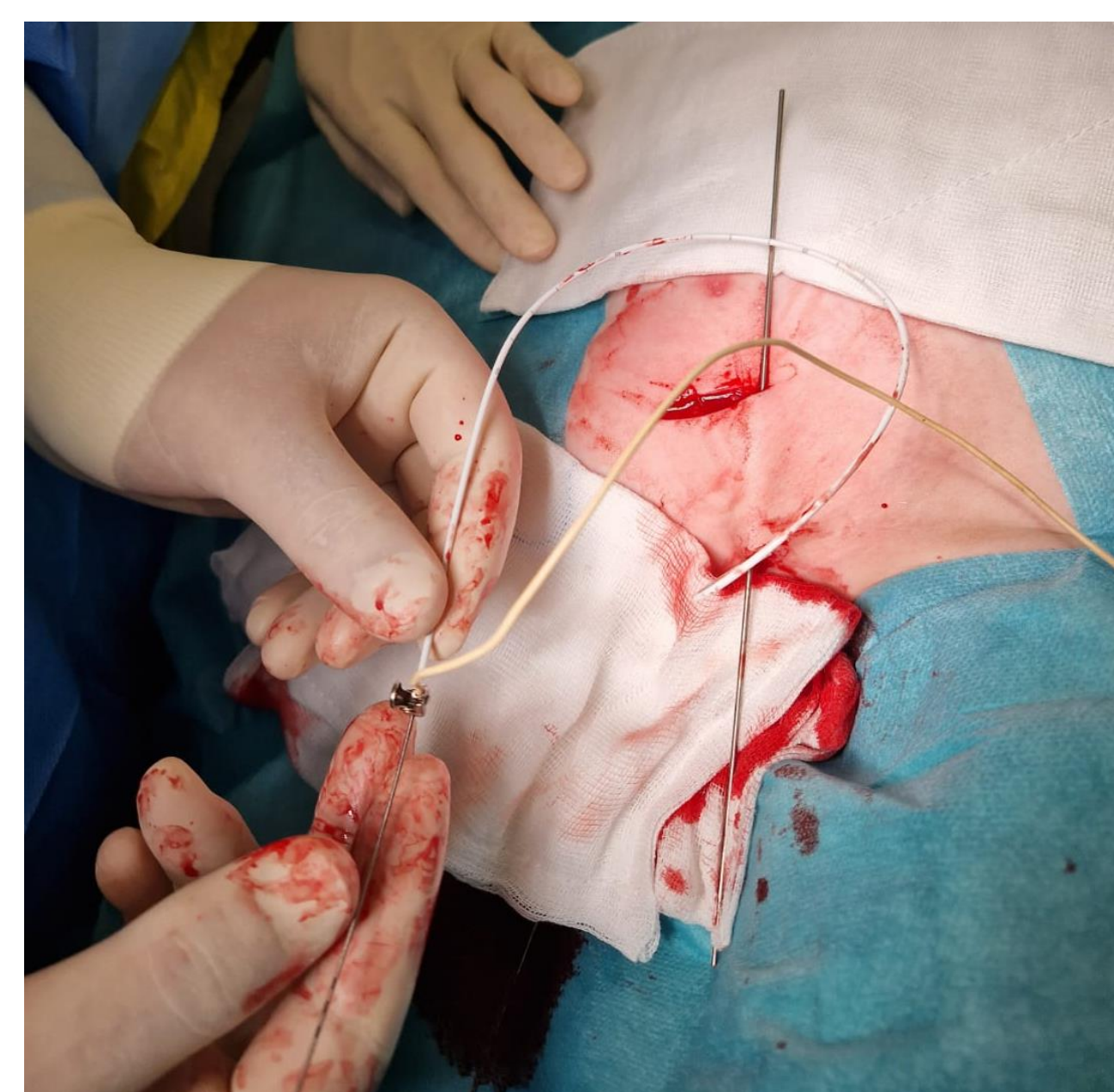
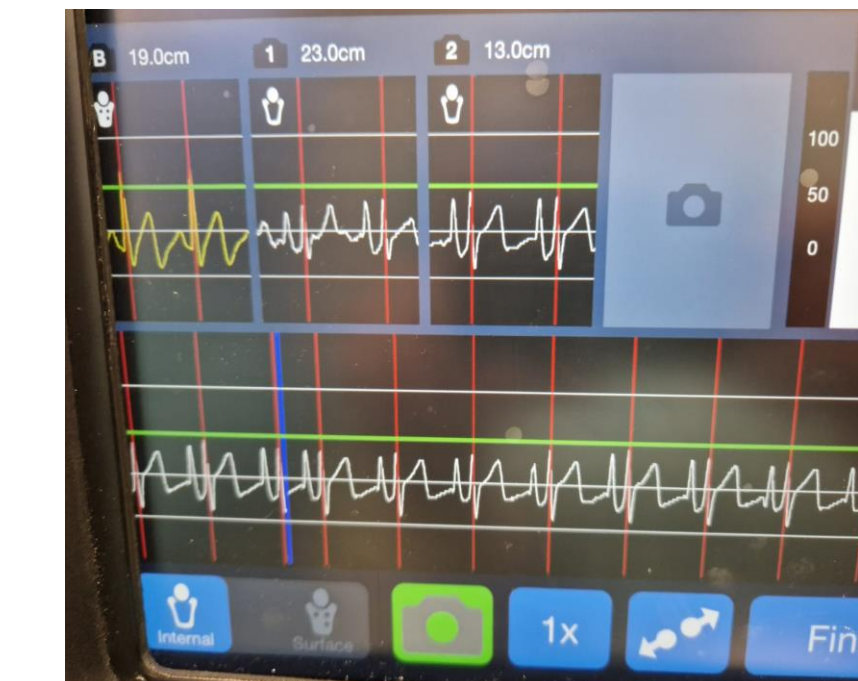
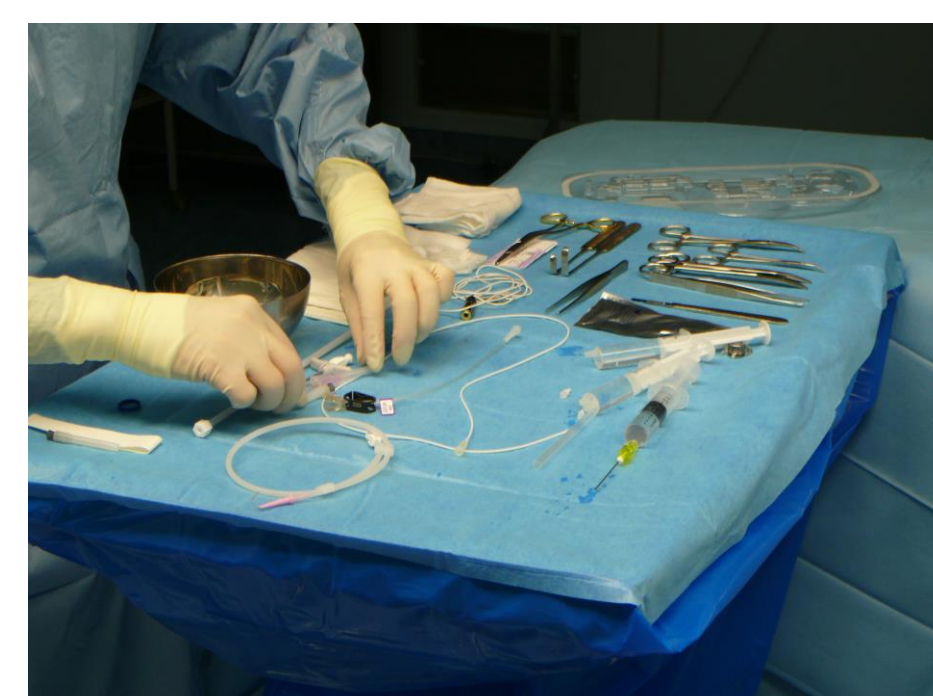
Objectives and method:

We analyzed 70 children with ages ranging from 2 months to 18 years (average 7,17 y) admitted to our hospital between January 2019 and October 2023, requiring TIVAD insertion. In these children ultrasound-guided vein puncture was performed, intracavitary ECG (IC-ECG) technique was preferably used to control the correct catheter tip position.

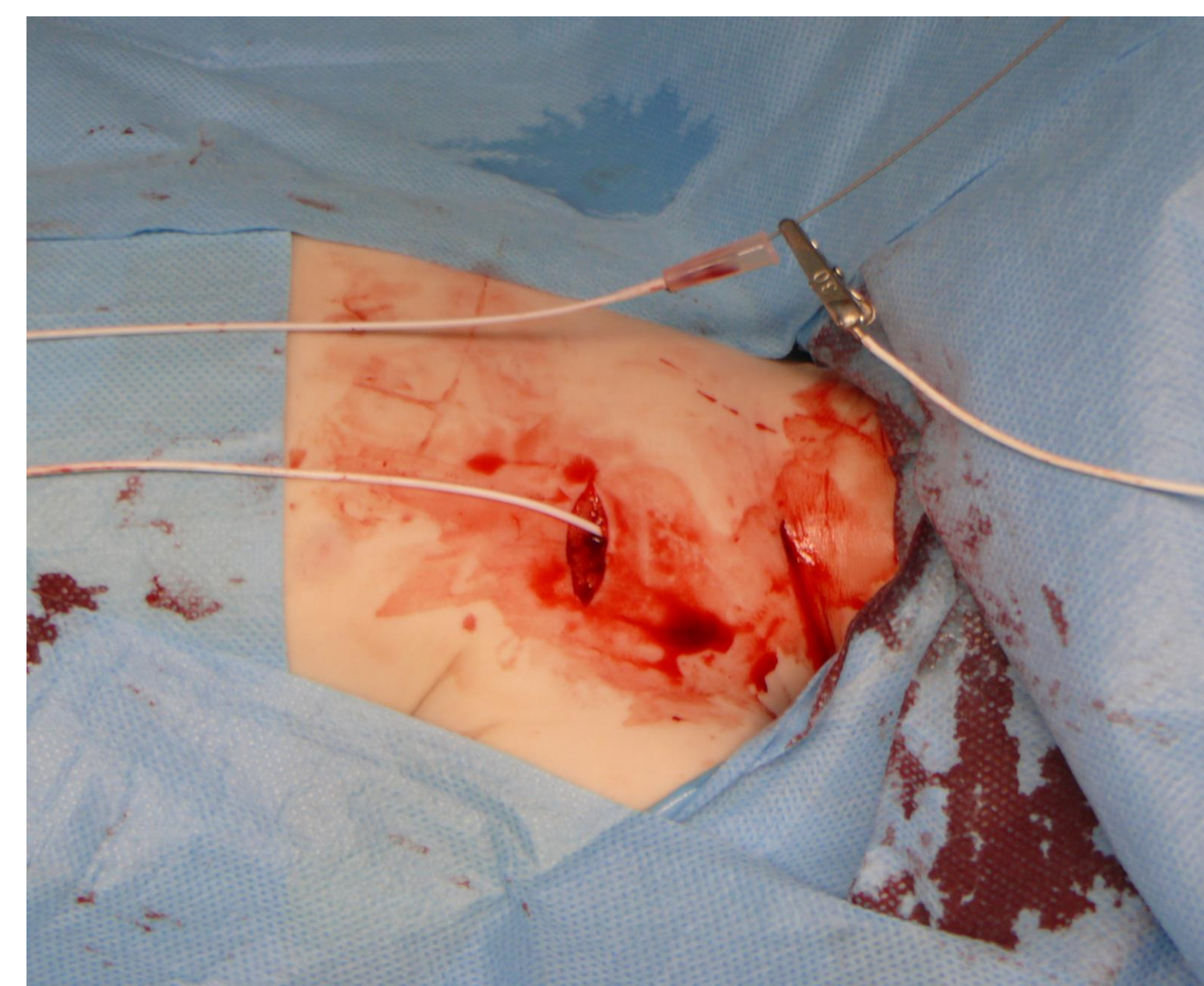
Results:

We have successfully inserted **70** TIVAD devices, consisting of **53** portacaths, **9** Baby ports, and **8** PICC ports. All devices were inserted under ultrasound control on the first attempt. The dwell time for these devices ranged between 32 to 1000 days (19146 catheter days - average **344** days). Currently, 26 TIVAD devices are still in place. Of the 27 catheters that were removed, 9 were due to infection, 3 were removed due to malfunction, and 5 protocols were ended due to the death of the patient. The complication rate for these procedures was **0.7 per 1000 catheter days**, which is comparable to the world's data. There were no early complications, and IC-ECG was used as the only technique for catheter tip location in 66 cases (**94%**). In four cases (6%), we had to use fluoroscopy due to severe skeletal deformities that made the insertion of guidewire or catheter problematic, and there were repeated problems with the maximal P-wave detection.

Pictures and video:



IC-ECG after catheter insertion



IC-ECG after catheter tunneling



IC-ECG after system completing (video)

Conclusions:

Inserting TIVAD in children as another type of CVAD is entirely appropriate under the SIC-PED protocol, which should be followed without any deviations. It includes the insertion of all types of TIVAD in children such as Baby ports, PICC-ports and portacaths. In children, where the intravascular distance between the optimal and suboptimal position of the catheter tip is too short, IC-ECG is a reliable method for ensuring that the catheter tip is correctly positioned and IC-ECG helps us to place it precisely, preventing complications resulting from malposition.

References: 1. Mauro Pittiruti, Davide Celentano, Giovanni Barone, Vito D'Andrea, Maria Giuseppina Annetta and Giorgio Conti A GAVeCeLT bundle for central venous catheterization in neonates and children: A prospective clinical study on 729 cases The Journal of Vascular Access 1–12 © The Author(s) 2022 Article reuse guidelines: sagepub.com/journals-permissions DOI: 10.1177/11297298221074472 journals.sagepub.com/home/jva
2. Francesca M. Shilati, Mehul V. Raval, Timothy B. Lautz Technical factors and outcomes in pediatric central venous port placement, <https://doi.org/10.1016/j.jpedsurg.2021.02.055>
3. Mariela Dore S. Barrena Paloma Triana Junco Alba Sánchez Galán Javier Jiménez Gómez Leopoldo Martínez: Is Intraoperative Fluoroscopy Necessary for Central Venous Port System Placement in Children? , DOI <https://doi.org/10.1055/s-0038-1675773>. ISSN 0939-7248.

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