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Prevention of catheter-related infections in children with tumors of the musculoskeletal system

Maxim Rykov¹, Elena Gyokova¹

¹) Institute of Pediatric Oncology, Russian Federation

Background: The treatment of musculoskeletal tumors in children requires numerous courses of chemotherapy that necessitate adequate vascular access. Implantable venous port-systems are free from many of the disadvantages associated with the use of external central venous catheters. Our goal was to reduce the occurrence of infectious and thrombotic complications in children with central venous systems.

Materials and Methods: From 2008 to 2012 we observed 281 patients with tumors of the musculoskeletal system aged 6 months to 17 years, for 147 (52.3%) of which implanted venous port systems were used and for 134 (47.6%) with external subclavian catheters. Estimated criteria: the development of catheter-related bloodstream infections and cases of catheter thrombosis. In cases of thrombosis, we injected the system with a 25,000 IU dose of urokinase with an exposure of 15 minutes. To seal the catheter between the usages, we used heparin or a solution containing taurolidin (no catheter-related infections were noted).

Results: Periportal tissue infection was observed in 3 cases (2.0%) of the patients with implanted venous ports, while the children with subclavian catheters puncture site infection was noted in 89 cases (66.4%). No catheter-related bloodstream infections were noted at children with venous ports. Thrombosis of venous ports was observed in 7 cases (4.7%), which caused by incorrect exploitation. The development of catheter-related bloodstream infections was noted in 18 cases (13.4%) at children with subclavian catheters. Subclavian catheter thrombosis was observed in 47 cases (35.0%). The treatment of complications caused in exploitation of a subclavian catheter required its replacement in 29 cases (21.6%), with the necessity of another general anesthesia. All venous ports worked satisfactorily. All cases of thrombosis were successfully treated.

Conclusion: The use of taurolidin solution to close the venous system in the intervals between treatments prevents infection. The treatment of catheter-related infections is more effective with a combination of taurolidin and urokinase, which provides lysis of the thrombus as a source of bacteria. The local use of a gel containing taurolidin at endoprosthesis infecting is possible. The number of complications is significantly higher in patients with subclavian catheters, which rises the risk of limb endoprosthesis infection.

E-mail (main author): wordex2006@rambler.ru