PRESS INFORMATION **Gliwice, 8th April 2019**

The world's first complex tissue transplantation in the head and neck area combined with bone marrow transplantation

Doctors from The Oncology and Reconstructive Surgery Clinic and Department of Bone Marrow Transplantation and Hematooncology from Cancer Centre and Institute of Oncology in Gliwice conducted the world's first extensive transplantation of head and neck organs combined with transplantation of the modified bone marrow. Due to the age of the patient who is only 6 years old, this unique procedure took place in Silesian Centre for Heart Diseases in Zabrze, which has a paediatric ward.

- *This treatment is a sensation on a global scale* – proudly emphasizes prof. Krzysztof Składowski, Director of Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology, Gliwice Branch. *No one has managed to carry out simultaneous transplantation of organs, tissues and bone marrow* - he added.

An unfortunate accident with happy ending

Five years ago, a 1-year-old boy swallowed soda lye granules, popular pipe cleaning chemical. Following this unfortunate accident he suffered from necrosis of the head and neck organs, bottom of the tongue, larynx, throat, trachea and oesophagus down to the stomach. From that moment on the child did not eat solid food (it was fed exclusively by tube attached to an intestine) and breathed through the tracheostomy tube. The child could not learn to speak.

- *In the first stage of treatment, 9 months ago, we reconstructed from the large intestine the oesophagus within the mediastinum area up to the neck. The second stage of treatment was the extensive transplantation, conducted on the 21st of March in the Silesian Centre for Heart Diseases, of the neck organs collected from the deceased donor i.e. the root of tongue, larynx, throat, cervical part of the oesophagus, hyoid bone, short neck muscles and all four nerves, which innervate the larynx. It required us to perform numerous vascular anastomosis* - explains the intricacies of the surgery prof. Adam Maciejewski, Head of the Oncological and Reconstructive Surgery Clinic of the Oncology Centre in Gliwice.

Normally after this type of treatment, immunosuppressive treatment is necessary to prevent rejection of the transplanted organs. For the rest of their life patient must take immunosuppressants that shorten their life for at least a few years and cause side effects. One of them is the increased risk of infection, which in the case of permanently lowered immunity is very dangerous for the patient. For this reason intensive research is being carried out around the world to develop a procedure designed to completely eliminate or at least greatly reduce the need for lifetime use of immunosuppressive drugs.

- *There is a theory according to which if the patient undergoing organ transplant surgery is administered with cells from the bone marrow of the same donor there is a chance to create tolerance. The aim is to reduce the risk of rejection of transplanted organs and reduce or even discontinue immunosuppressive treatment* - explains prof. Sebastian Giebel, Head of the Bone

Marrow Transplantation and Hematooncology Department and Deputy Director of Clinical Matters in Oncology Centre in Gliwice.

An innovative procedure for bone marrow transplantation

The evidence that this is possible comes first of all from experiments carried out on animals. Globally there have already been attempts at human trials, but they concerned kidney transplants from living donors.

As underlined by prof. Sebastian Giebel, the biggest problem is that the bone marrow cells taken from the donor may be rejected by the patient's body. To prevent this a preparatory treatment aimed at reducing the recipient's immunity was used. However, it is only possible for scheduled procedures from living donors. In case of transplantation from the deceased donor, which cannot be predicted, the use of such treatment is impossible. And this was the situation of hematoonologists from the Oncology Centre.

They had to develop their own innovative procedure for bone marrow cell transplantation.

- *According to the procedure we have developed bone marrow cells are administered to the patient only after 10 days of organ transplantation. At this time the recipient routinely uses a very intense immunosuppressive treatment that paralyzes their immune system. Therefore, we transplant bone marrow cells when the risk of their rejection is the smallest* - explains prof. Sebastian Giebel.

For such a transplant to be safe the harvested bone marrow requires a special preparation. Of all bone marrow cells only stem cells must be isolated. The immune cells present in the marrow could attack the recipient's organism. -*The stem cells are very sensitive and in order to survive 10 days they had to be cryopreserved (frozen in liquid nitrogen)* - says prof. Sebastian Giebel.

The organs and marrow were collected from the donor in the Silesian Centre for Heart Diseases in Zabrze. The bone marrow itself was modified and stored in the Oncology Centre in Gliwice.

Rehabilitation after the surgery will take several months

- *The purpose of this complex procedure is to create conditions for the patient to function normally, that is proper breathing, eating and speech learning. Currently the boy has circulatory and respiratory capacity. He is in the process of rehabilitation, which is to restore the functionality of the respiratory and alimentary tracts. We have to wait 6-9 months for the final results of our treatment* - says prof. Adam Maciejewski.

The uniqueness and novelty of this treatment, as emphasized by the specialists involved (doctors, scrub nurses, anaesthesiologists), is mainly based on the fact that no one in the world has conducted a simultaneous complex tissue transplantation combined with extracting the marrow and administering it to the patient in order to eliminate or reduce lifelong immunosuppression. At the same time it was the second organ transplant surgery in the world carried out on a child.

- *I hope that the surgery will initiate a new way of treatment that will eliminate the need for lifelong immunosuppression in this type of allogenic transplants* - summarizes prof. Adam Maciejewski.

Doctors from Gliwice emphasize, however, that attempts to reduce immunosuppressive therapy will be made only after one year and the effectiveness of the modified marrow transplantation can be assessed no sooner than after 2 years.

Additional information:

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