

Bone External Fixation: at the Crossing Point of Latvia's and the World's Development.

Andris Jumtins Ph.D., Prof.
Ruta Jakusonoka Ph.D., Assist. Prof.
Silvestris Zebolds Ph.D., Assist. Prof.
Department of Orthopaedics Riga Stradiņš University
Hospital of Traumatology and Orthopaedics, Riga, Latvia



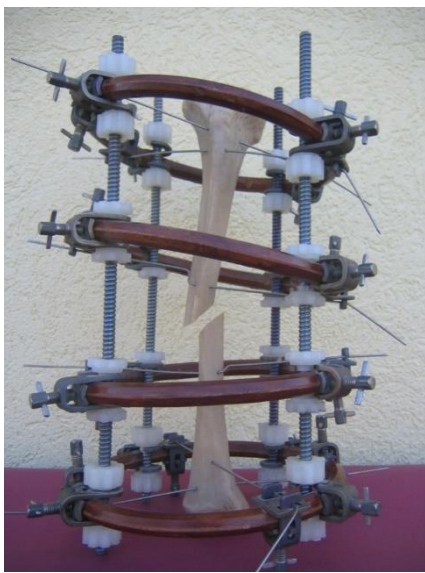
The method of external fixation is transcutaneous bone fixation with Kirschner wires, Schanz screws or Steimann rods, which are fixed in a circular, mono or bilateral frame, surrounding the extremities. It is used primarily for the fixation of open fractures, their consequences caused limbs deformation correction, and as a method of temporary surgical treatment in the damage control orthopaedics protocol.

In the 1980s, Latvia, thanks to the contribution of the Academic Professor Viktors Kalnberzs in the development of circular external fixation device (*Kalnberz external fixation apparatus*) and achievement of the Latvian Traumatology and Orthopaedics Research Institute (now - Hospital of Traumatology and Orthopaedics) incl. Laboratory of Biomechanics and Professor Haralds Jansons, was certainly the leading position in the world in the field of bone external fixation.

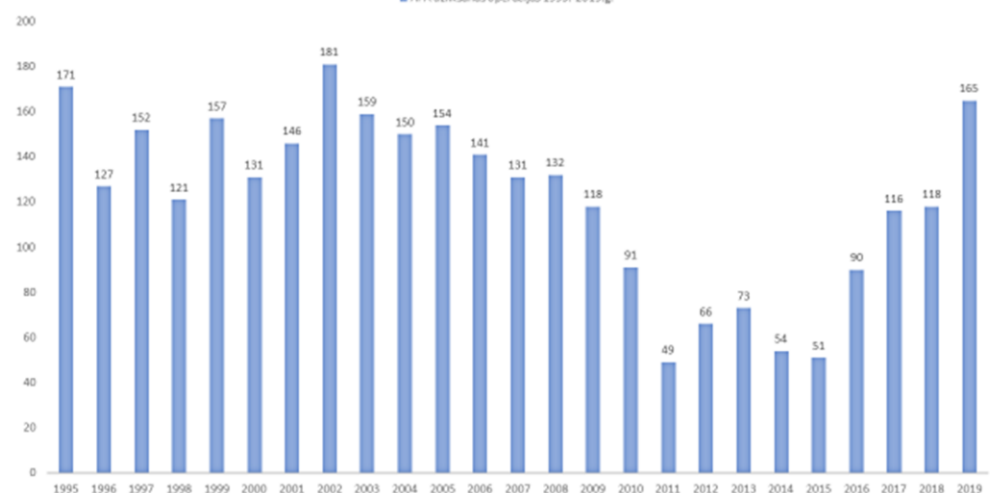
The analysis of the literature and Hospital of Traumatology and Orthopaedics statistics leads to conclusion that method of external fixation is currently used less frequently, the indications of which have changed significantly over a period of 40 years, but remains an indispensable method in case of complex fractures, its consequences and orthopaedic diseases surgical treatment.

In the last two decades in the world and Latvia orthopedics mark a trend in the method of external fixation as a temporary surgical treatment method prior to open reduction and internal fixation.

The external fixation method has seen many significant innovations (computer assisted deformation correction, use of 3D printers in the manufacture of the frames, etc.), but there are still no revolutionary developments - unilateral and circular frames are widely used in clinics.



ĀFA UZLIKŠANAS OPERĀCIJAS 1995.-2019.G.



Aim of the study is to analyse the progress of the development of external fixation method in Latvia and the world over the last four decades, focusing on changes in the indications of the method, the modernisation of external fixation devices, the introduction of innovative technologies in the manufacture and use of external fixation devices, in order to predict further developments of this method.

The study is based on a comprehensive analysis of literature, interviews of a recognised author of this method in Latvia, personal experience of study authors and archival materials of the Hospital of Traumatology and Orthopedics. The study method is a descriptive analysis of the available material.

1. In the analysis of the development of traumatology and orthopaedics all over the world and in Latvia at the end of the 20th century and beginning of the 21st century, it can be concluded, that the external fixation is still indispensable method for the surgical treatment of complex fractures, their consequences and orthopaedic deformations.

2. The use of this method worldwide tends to grow, while in Latvia it has decreased significantly to the turn of the century, after which it has stabilised and is currently experiencing some positive dynamics.

3. The indications for the application of the external fixation method in Latvia have decreased over time, with an overall increase in the world. The current balance is considered to be optimal.

4. Innovations of the external fixation method evolutionary develop it, the Latvian tradition-based contribution to this process can be improved at this moment.