The Limb Lengthening and Reconstruction Society: ASAMI-North America

Thirteenth Annual Scientific Meeting

Abstract

Category : Deformity Correction

Title: Technical Tips to help Optimize the use of the Taylor Spatial Frame

Presenting Author:
S. Robert Rozbruch, MD
Hospital for Special Surgery
535 East 70th Street
New York, NY 10021

tel:212-606-1415
fax:212-774-2744
email: RozbruchSR@hss.edu

Co-authors:
1) Arkadey Blyakher, MD Hospital for Special Surgery
2) Svetlana Ilizarov, MD Hospital for Special Surgery

What was the question?

What are technical tricks that help optimize the use of the Taylor Spatial Frame?

How did you answer the question?

We reviewed our experience with 120 consecutive Taylor Spatial Frame cases. We listed examples of technical tips that have helped us use the frame most efficiently in difficult situations.

What are the results?

1. If a wire or pin fixation bolt or cube is in the way of a strut, one can connect the bolt or cube on the inside of the ring with a plate from a different ring hole.

2. If a strut is too long as a result of very close rings, one can effectively lengthen the strut by adding a socket with a plate outside the frame.

3. If rings are too close for the use of a standard strut, one can use 2 universal hinges on the rings connected to a compression/ distraction rod with plates.

4. To increase the stability of the frame, one can connect the half pins to the rings at two different points.

5. To prevent rotation of the half-pin cube, one can connect additionally connect the cube to the ring at a second point with rod and post.

6. In order to dynamize a TSF that is not neutral, we have devised a washer that allows controlled shortening. This "washer pad " is inserted between the ring and the strut. It requires a longer shoulder bolt and the use of the computer program.

7. If the strut is hitting the skin, one can use a plate to translate the strut outside the ring after the correction.

8. In order to enable the use of a 2/3 ring at the distal femur for improved ability to flex the knee, a modification is needed. Two options exist:

a. turn the x-ray and frame upside down and switch sides, (i.e), right to left.

b. apply the frame with a 60 degree rotational offset and make the change on the computer program.

9. We calculate mounting parameters relative to the origin in the operating room. We apply temporary rods in the center holes of the reference ring in both the coronal and sagittal planes. We then get a live fluoroscopy picture with the rods superimposed. We can then count holes on the ring (12 mm each) calculating the distance to the origin.

10. When mounting the frame for a forearm deformity, we place the forearm in the neutral position and substitute the hand for the foot. We then define flexion as varus; extension as valgus; radial deviation as apex posterior; ulnar deviation as apex anterior.

11. When using the frame to correct an ankle contracture in the sagittal plane, we choose the center of the talus on the lateral projection as the origin. The inclination of the ankle is 25 degrees off the neutral axial plane. Since the frame is applied neutral, we input a 25 degree internal rotation axial frame offset in the mounting parameters. This then leads to a more correct plane of correction. This does not, however, account for the fact that the ankle joint is also inclined 10 degrees from the neutral coronal plane.

12. If an Ilizarov ring is in place with a bone deformity and one wants to use the TSF for a total residual correction the following can be done. Connect a TSF ring to the Ilizarov ring with plates and or sockets. Then attach struts, and perform the correction.

What are your conclusions?

The use of the Taylor Spatial frame can be optimized with a number of technical tricks outlined above. These include the use of Ilizarov frame parts, Ilizarov methodology, and manipulations of the computer program. It may be

advantageous to input these manipulations into the computer program. Case examples and illustrations will be presented.