WHY TTA-2?

TTA is entering the second decade of clinical use. Kyon has sold over 100'000 TTA implant sets to about 1'000 surgeons worldwide and almost all veterinary orthopedic companies have either copied or modified our TTA system. Kyon's goal is to provide surgeons and their clients with real benefits and we believe that TTA-2 has the potential to:

- reduce the risk of infection,
- reduce tuberosity trauma,
- speed the incorporation of the implant into the bone and shorten the surgery time.

It is in the expectation of these benefits that we want to introduce TTA-2.

An article in the most recent issue of VCOT (4/2013) presents outcomes of TPLO revisions, which resulted in surgical site infections (SSI). The cases are from Gulf Coast Veterinary Specialists, Houston, Texas, a prominent veterinary hospital in the US. If you haven't, please read this report. I will mention only the most striking bit of information from it – out of 668 cases operated with the Synthes TPLO system, there were 57 infections, or 8.5%. These TPLOs were performed by two of the most respected surgeons in one of the best hospitals in the US, using what would be considered state of the art implants. Whatever else is playing into this number, including the emergence of bad bugs in about the same period that the study covers, the information we have from our surgeons suggest that with the current TTA we are looking at well below 1% SSI. A higher number is reported by Bob Botte (see for example his presentation at our 2010 symposium available on our website) of 2.2% from over 500 cases. In view of the fact that, as a traveling surgeon, he operates at 50 different general practices, I consider this a remarkably low incidence. Preliminary info from Andy Torrington on some 700 TTA cases operated at his clinic that they are analyzing for infections, shows approximately a 0.5% infection rate.

One could say, without exaggerating, that our TTA system is superior to TPLO (at least Synthes) in one of the most serious and daunting surgical problems – infection. But, we have seen cases, very few, but very disturbing, where TTA infection has resulted in bone loss of the tuberosity that has left hardly any bone there to work with. I have always been troubled by our instruction to peel off the periosteum from the tuberosity in order to make the fork insertion an easier task. Blood circulation of the most crucial bit of bone is further compromised – we have been rather lucky that this part of the surgical execution has not produced more problems than it did.

TTA-2's most important benefit has to be that we will not be touching the tuberosity once the partial osteotomy is performed. It may take years and thousands of cases (if ever) to actually prove that the infection rate of TTA-2 will be reduced to below that of TTA, but we must respect the destruction that damaging bone perfusion causes, and my hope is that I will not learn of another single case where the tuberosity has just melted away. (I have seen only two cases, but am sure that there are more amongst the 100'000.)

In original TTA, the cage is already designed to minimize the volume of the metal and to allow the bone to infiltrate the cage. The TTA-2 cage has an added mechanical function – to transfer some of the shear – and we have gone to extra length to minimize the amount of metal. Toward, that goal we have also replaced c.p. titanium grade 2 with much stronger grade 4. You could say that the TTA-2 cage calls for a new term to describe the process of bony integration. In addition to the current terms "on-growth" and "in-growth" – we could call it "through-growth". We anticipate that mechanical soundness of TTA-2 will be reached faster than with TTA – as bone catches onto the ribs of the cage, the cage should be stable enough to allow bone to simply move through the void inside the cage and fill it without any risk of mechanical failure. The cage is expected to fill with fully perfused bone. The TTA-2 cage is treated by a special process of anodization (Biocer®) that has been demonstrated to lead to a faster, tighter incorporation into bone. With respect to the role of a foreign body in infections – the simple picture, probably quite correct, is that as soon as you insert the implant into the body the race is on between the bugs and the host cells to cover the implant surface. Cells (osteoblasts) have been shown in vitro to attach and stick to Biocer® treated titanium so much so that they had to be broken in order to get them off the surface.

We have full confidence that TTA-2 will require a shorter period to mechanical consolidation with reduced risk of infection due to both, surgical technique and implant characteristics.

An additional benefit may be shorter surgery time – this, as always, is very much affected by the surgeon and/or the surgical team. If our proposal for the use of the sawguide is accepted, it may prolong the surgery by a few minutes. Time required to gradually open the gap will also add a few minutes, but these losses may well be offset by the elimination of drilling holes and inserting screws. I imagine that surgical time may be reduced by 10 to 15 minutes. This is not only of monetary benefit, but, again, any time saved in surgery will reduce the risk of infection.

TTA-2 cages will be sterile packed and probably only 9 sizes will be needed. This will reduce stock, providing monetary and effort benefit. Perhaps a more important benefit will come from elimination of implant cleaning and sterilization. Since the cage is much longer and fills the gap with a scaffold for bone through-growth, use of bone graft, autologous or allograft, will likely be obviated – for those of you currently using allograft a saving in costs – for those collecting a graft, a saving in time and potential morbidity.

Our TTA-2 production costs are very similar to a set of TTA implants and the TTA-2 selling price will be similar to TTA. However, overall, we believe that you will have substantial savings in your practice. We have filed for a patent to protect TTA-2 (with Joop Hopmans and me as inventors) to hopefully prevent our competitors from doing what they have done with TTA – while legally justified, we feel that they have unfairly taken an advantage of Kyon's investment not only into development of the TTA system, but also into instructing several thousand surgeons at our courses during the last decade.

We wish you a successful start with TTA-2 and please stay in close touch in the weeks and months ahead.

Slobodan Tepic

Zurich, August 2, 2013