BOA Travelling Fellowship Report
Andrew Sprowson Management of Infection Award

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Executive Summary

I utilised the BOA Travelling Fellowship Award to visit the Endo-Klinik in Hamburg, Germany. I spent one week in July 2017 at this renowned centre and was able to pick up several key things that I would like to bring into my routine practice.

The set-up for the management of prosthetic joint infections (PJI) is immensely focused. The Endo-Klinik aggressively implements basic principles of management from the changing rooms through to peri- and post-operative care. The multidisciplinary team is decisive and there is a fantastic sense of collegiality and shared vision.

There is also a research drive geared towards improving clinical outcomes whilst also addressing the necessity for basic science research. Biological markers are utilised and critically evaluated with results of their practice routinely published. There is an immense drive towards establishing early diagnosis through use of biological markers.

Finally, the service itself is rapid and runs like clockwork. The staff are well-drilled and the culture is goal oriented so individuals and teams can get on with the necessary tasks to facilitate smooth running of the theatre unit. There are many features which I believe will be of value in the NHS.

The trip was supplemented by an enlightening visit to the Link Orthopaedic factory.

Overall, the experience of five tremendous days has given me a lot of material to reflect on as I continue in my training in the UK. I'd like to thank Professor T.Gehrke and Dr Akos Zahar for inviting me, and the BOA for facilitating this trip.

Report

I visited the Endo-Klinik, Hamburg, Germany for one week in July 2017. Having read and heard the experiences of others, my aims and objectives included improving my understanding of the approach to management of prosthetic joint infections, and appreciation of the service delivery and the logistical challenges.

Professor Hans-Wilhelm Buchholz founded the Endo-Klinik in 1975. He was a contemporary of Sir John Charnley and a pioneer of arthroplasty in Germany. The Endo-Klinik is a tertiary clinic dealing exclusively with orthopaedics. It takes referrals from all over Europe and increasingly from around the globe to deal with complex arthroplasty and infection. Some of the cases featured implants that were completely novel to every one (Fig 1)

The Endo-Klinik carries out approximately 6000 arthroplasty cases annually, of which 400 are for infection. With respect to infection the unit is very aggressive and methodical in its approach. A multidisciplinary team meticulously reviews each referral with a strategy for pre- and post-operative management with the intention of performing a one-stage revision in all cases. Pre-operatively inflammatory markers and joint aspirations are evaluated. If there is doubt then an open biopsy is performed and subject to histological and microbiological review (including the use of PCR).

The process of surgery starts for the team at the door of the changing rooms. There are strict procedures regarding dress code that have to be adhered to (Fig 2). Movement in theatres is controlled by the theatre layout with a two dedicated theatres for PJIs that have doors that can't be opened simultaneously. Following surgery everyone discards their clogs in the disposal area for sterilisation and gets changed into fresh scrubs.

In surgery the mantra "if in doubt, cut it out" dictates and I was able to witness the meticulous but aggressive approach to tissue debridement in the first case I assisted on. Ultimately despite hoping to carry out a single stage revision, the extent of the soft tissue damage was such that it wasn't possible.

Post-operatively, the group of patients having single-stage revisions are given intravenous antibiotics for 10-14 days. If the microbe is particularly problematic this can be extended, in few cases, to 21 days. Patients undergoing first-stage revisions are usually given 4-6 weeks of antibiotics with regular evaluation of their blood markers.

There is also a clear intention to get everybody rehabilitating as soon as possible so physiotherapy and occupational therapy are intimately involved from the outset.

I had the opportunity to talk to Dr Lars Frommelt (microbiology) at one of the twice-weekly MDT meetings and was given an overview of the institutional deep infection rate (around 1%), but with an acknowledgement of the challenges they faced with maintaining regular follow-ups (as a lot of the patients are not native

to the region so are difficult to follow-up). He was certainly more optimistic about the improvements in questionnaire designs for follow-up of patients with respect to superficial surgical site infections.

In total I observed 23 cases (6 of which I was able to scrub in for). The Zimmer Synovasure® Alpha Defensin Test was used during a revision for aseptic loosening of an uncemented acetabular component. It is a quick and easy method of determining whether there was any infection prior to commencing the revision and the unit has published their experiences with this test kit. I also assisted with acetabular reconstruction with bone graft and cages (Fig 3), as well as the utilisation of trabecular metal augments. A total femur replacement for infection and an endoprosthetic replacement of periprosthetic fracture demonstrated a drive towards definitive management for early mobilisation. In addition to that I assisted on surgeries for infection of both the hip and knee.

The EndoKlinik has got its own onsite bone bank and their level of consumption means that they maintain exclusive usage. I was particular impressed with the acetabular reconstruction using femoral head grafts that were shaped to fit defects and then reamed down.

The team at the EndoKlinik kindly arranged for me to visit the Link Orthopaedic factory in the northern suburbs of Hamburg. Link is a family owned company with a very close association with the EndoKlinik. They manufacture prosthetic replacements in close collaboration with the EndoKlinik and with the exception of sterilisation services they produce, manufacture and evaluate quality for all their own implants. It was a good experience to see the level of engineering dedication and quality with a lot of quality assurance being carried out by hand one implant at a time. They also increasingly manufacture custom-made implants using CT scans and 3D printers.

The EndoKlinik is a private institution, with clear financial pathways. The patients they see are almost always insured or funded as such they are in a position to develop streamlined pathways to maximise their efficiency and case output. The advantages of this cannot be discounted but must be taken into consideration when attempting to transfer them to the NHS. The culture that exists at the EndoKlinik is probably the single most important thing I would try to bring across, as that would be the bedrock of improvement.

Hamburg is a city with a rich history. It has existed for many hundreds of years an economically powerful city-state before German unification in the 19th Century. It's status as a major port contributed to its strength and title as the second city of Germany. I took the opportunity to explore the city on foot and using the underground rail system and found it to be an incredibly friendly city.

The educational experience has been excellent and as I move forward in my career I have many things I'd like to explore and implement in my own practice. I am grateful for this opportunity that the BOA have facilitated. I would like to acknowledge Professor Thorsten Gehrke's kind invitation and Dr Akos Zahar's

kindness in facilitating this fellowship and accommodating me at the EndoKlinik (Fig 4.)

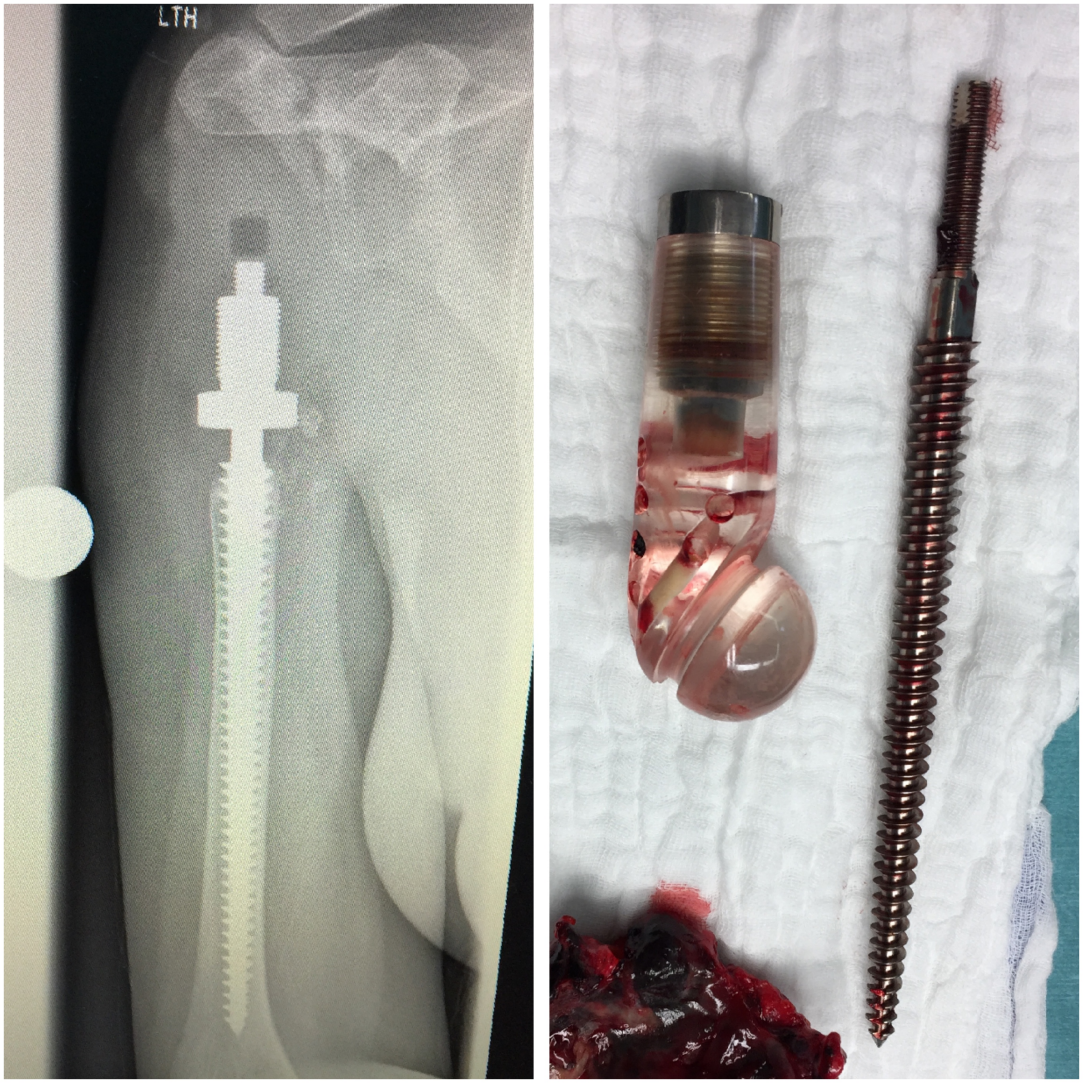

Figure 1 – A novel implant featuring a screwed in long humeral stem with modular Perspex head

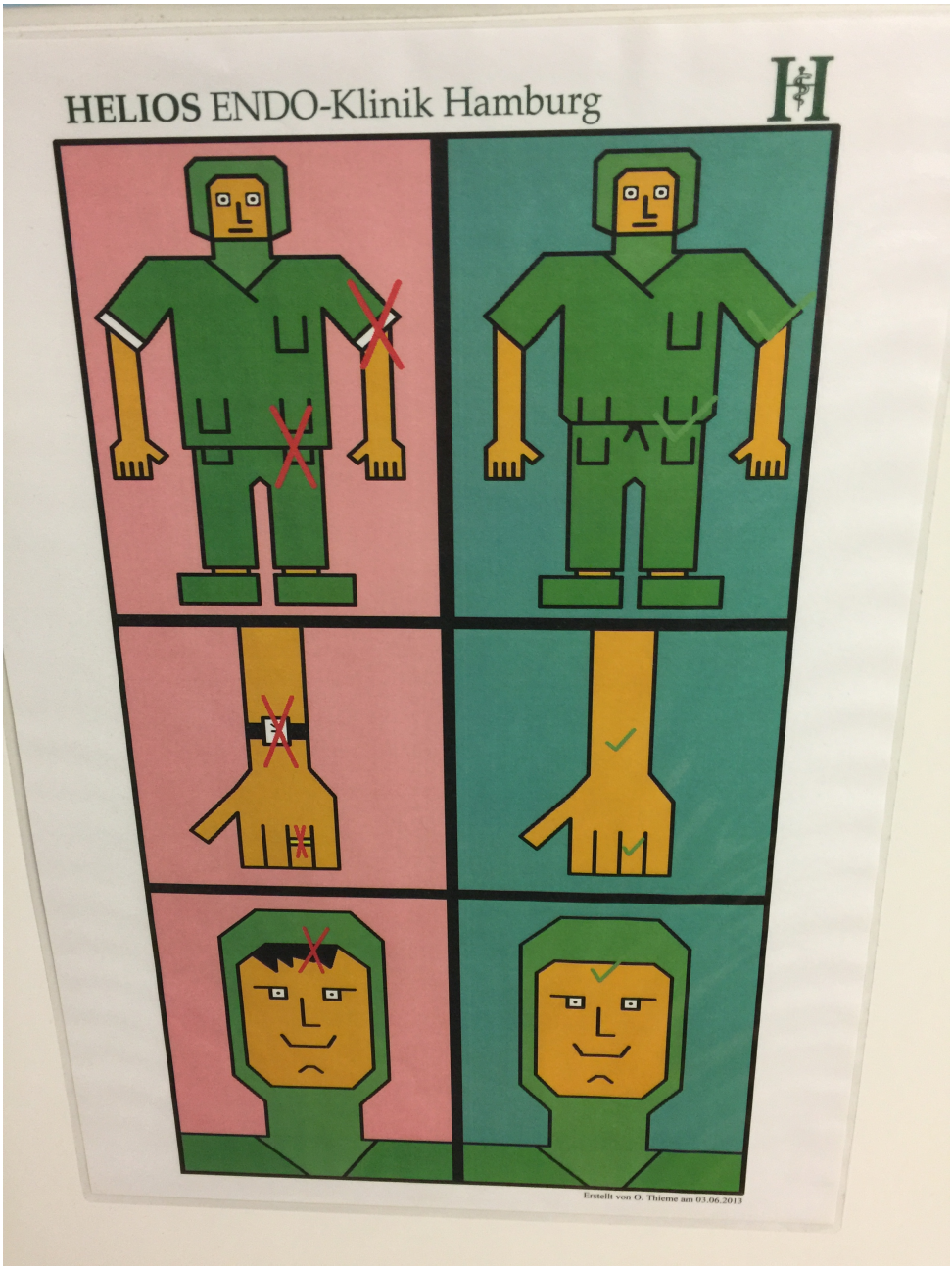

Figure 2 – Strict dress policy in the EndoKlinik

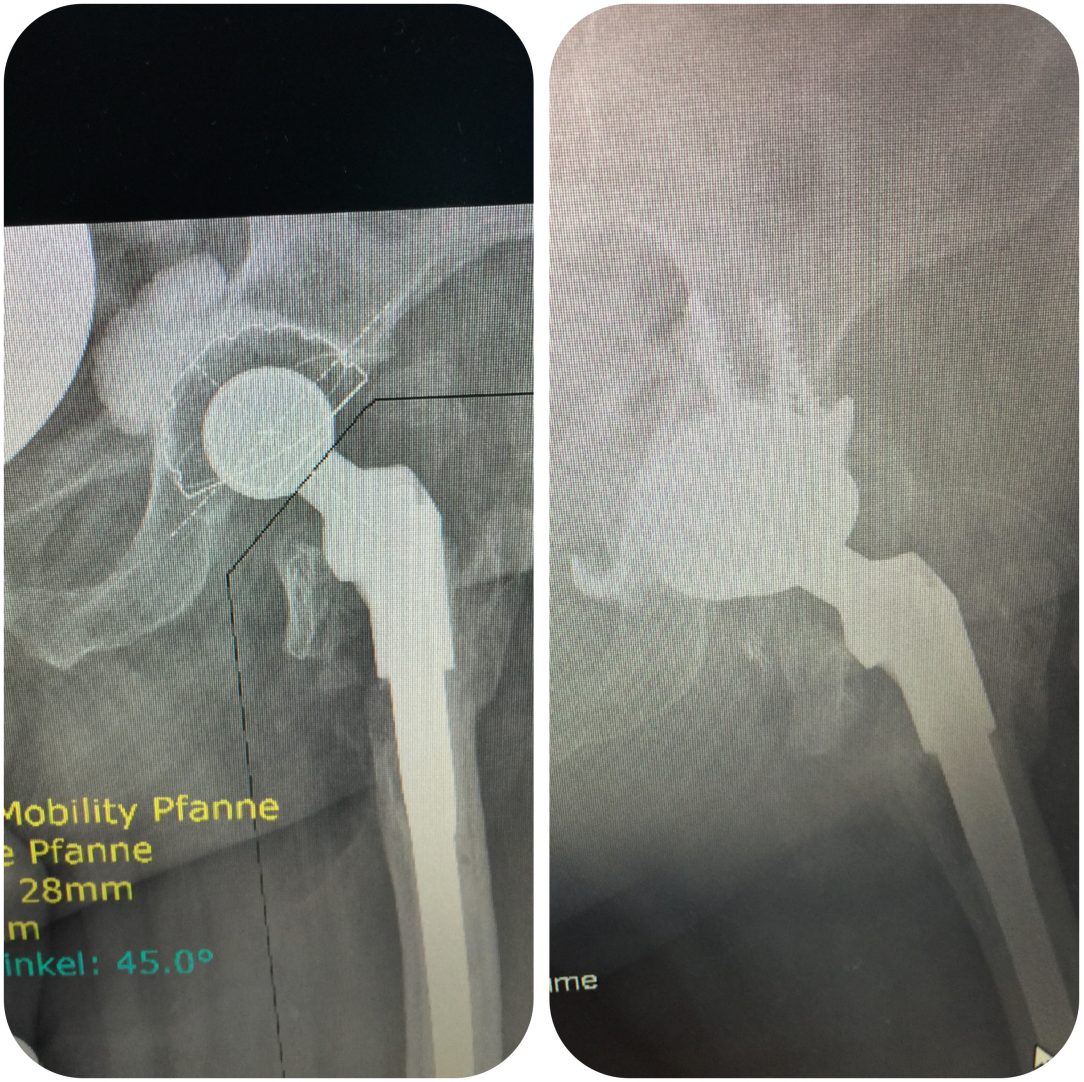

Figure 3 – Pre/Post Operative images of acetabular revision using a cage and dual mobility head/socket configuration



Fig 4 – The EndoKlinik. Dr Akos Zahar & I demonstrating the dress code.