



Hand Fracture Course. Khartoum 4th-5th February 2020

This was a course jointly sponsored by the BSSH and Bfirst.

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Introduction

There has been a BSSH/Bfirst project in Khartoum for the last five years, and latterly these have formed a pre-conference workshop for the Sudanese Orthopaedic Society's annual conference (SOSA).

2019 was a troubled year for Sudan. There was a revolution which was driven by the health professionals. This resulted in the arrest of President Bashir in April 2019 and a very dark few months where protestors and some doctors were arrested, tortured and on occasion killed. This ceased with the formation of an interim government in August 2019 and a power sharing agreement that is due to lead to national elections in 2022.

It was therefore not deemed safe to conduct a course in 2019, but at the end of 2019 we were asked to conduct a hand fracture course at very short notice to continue the preconference courses for the delayed SOSA conference. Fortunately all members of the team were identified and agreed to take part and book leave giving the required six weeks notice within the three days window we had.

Course structure:

This was a new course to be delivered and it was largely based on the Surgical Art hand fracture course that DB teaches on. However this course requires industry sponsorship particularly for the internal fixation exercises and a large amount of kit. Given that Sudan is

relatively resource-poor, especially in the government hospitals, the course was redesigned to cover techniques that didn't include costly plates and screws. Wiring techniques for the distal radius were also included. In addition, we were asked to conduct a clinic session to see patients with injuries from the revolution who were at various stages of reconstruction. This meant the course had to be pared down to more like one and a half days, with a half day clinic session.

We were then advised that the therapists were going to have their own teaching day on the second day and so the course was designed around these parameters.

Preparation:

Khartoum doesn't have bamboo or reeds that have been used on other Fracture fixation courses so chicken bone models were prepared. DB had a certain anxiety about travelling through customs with a suitcase full of bones, so used a food vacuum seal device to shrink wrap the constructed bones with a card stating 'surgical training model'. Letters were also obtained in English and Arabic stating that we had been invited to conduct a surgical training course. Copies of these letters were put in suitcases and carried in hand luggage. It was also necessary to obtain a large number of kirshner wires, and six days before travel unfortunately our industry sponsor informed us that it would not be able to supply these. There followed several days of intense wire sourcing. The main supplier was Surgical Holdings from whom we obtained k wires that had expired sterility dates. DB also was put in touch with Hanson Springs, a family run spring manufacturer in Rochdale who provided a large number of flexible steel wires 1mm diameter which were a surprisingly effective substitute. Stainless steel rods 1 mm diameter were also obtained from an online auction site where they were sold as welding material. Also a good substitute.



Drills were also required. We established that there were going to be eight candidate workstations as well as the demonstration workstation. This necessitated obtaining nine drills. We had hoped it would be possible to obtain these locally from doctors attending the course, but unfortunately this was not possible. There are specific regulations involving the transport of battery packs and power tools by air, and so these had to be complied with. Ikea cordless drills met the criteria, and had the added advantage of being cheap. Surgical Art expressed an interest in being able to use the drills from time to time after the course, (and one planned for Myanmar) and were persuaded to contribute to the purchase cost.



Travel:

SG, JH and DB travelled to Istanbul where they met up with NJ. All of us were delayed from initial check-in because the entry permit paperwork hadn't come through in time. Fortunately a copy of a letter from the Sudanese Ministry of the Interior sanctioning our visit, and requesting visas to be issued without cost, and also that exit permits to be issued for free smoothed the way and after a few emails from Turkish airlines to the Sudanese we were all allowed to board. Turkish airlines allow two items of hold luggage which was essential for the amount of kit we needed to take.

Khartoum: Day 1 Monday 3rd February

We arrived around midnight and were met by one of the orthopaedic registrars who provided us with the appropriate forms to fill in and obtained our visas for us (at no cost, thanks to the aforementioned letter). We then were taken in two vehicles to the Coral Hotel. This was situated very close to the bridge to Omdurman and so close to the location of the course. As we were travelling in the early hours close to the presidential palace, we were stopped at a checkpoint, but proceeded without hindrance.

The following morning we convened after breakfast and planned the practical details of the course. We were met at about 1pm and taken to the venue to ensure all was in place. Aliaa hospital was one of the military and private hospitals and the room looked like a boardroom! The tables were inset with leather and arranged as a horseshoe facing a large TV screen. Each had a couple of heavy armchairs. After rearranging the furniture in a more useful way to face the demonstrator table and the screen we asked for assurances that the tables would be protected with dust sheets and a wooden board so wayward drills and wires wouldn't cause damage. The audiovisual was excellent, and we were able to project from an iPhone or iPad mounted over the workstation to the main TV and two other smaller screens on the side of the room. Curiously, later models than iPhone 6 only project the image as a portrait image through the HDMI adaptor regardless of whether landscape or portrait on the phone screen. This was also true for android phones. We had an iPhone 6 and an older iPad and so didn't have any issues with projection.



Having established that all was in place, we were taken to meet the Director of the hospital who welcomed us, and we were shown the hospital facilities, theatres and therapy suites which were excellent. However this was not the government hospital, but a military and private hospital, with resources to match.

We were then treated to a boat trip on the Nile, followed by a trip out to a farm where we had the traditional barbecue, the Agasshe. We had the opportunity to spend some time talking to the surgeons, and hearing some of their experiences of the revolution which were humbling. I was embarrassed to have been complaining about the difficulties of pulling the course together to doctors who had been targeted, and in some cases arrested and tortured for helping the protestors.

Day 2 Tuesday 4th February

Early start arriving at Aliaa hospital. We were able to set up without difficulty. The desks had been covered with dust sheets and a square of hardboard which eased DB's concerns. The splint pan was switched on without fusing the electrics, and materials for the conservative management section were distributed.

The day was introduced by Dr Samir, chair of the educational committee, and then we got underway. The programme was as follows:

0830 Registration and coffee

0900 Welcome and Introduction

Part 1 Conservative management of hand fractures

0905 Lecture: Splints and Casts – an overview. NJ

Demo 5mins, practical in pairs 15mins

0915 Buddy & de-rotation buddy tape

0935 Mallet: stack and Zimmer splints

0955 Dorsal Blocking Splints

1015 Zimmer Traction Splint

1050 **Coffee break**

Demo 10 mins, practical in pairs 25mins

1120 POSI splint and POSI cast

1155 Metacarpal fracture palm cast

- 1230 Sugar tong cast - principles
1300 Bennett's cast, volar slab, scaphoid casts/slabs - principles

Part 2 Operative hand fixation techniques 1

- 1330 Lecture: Principles of fracture fixation
1345 Practical: Hand anatomy overview
1400 Surgical exposures
1420 **Lunch Break**
Demo 5 mins, Practical 20 mins
1500 Crossed k wiring
1525 Cerclage technique
1550 90:90 wiring
1615 Lister loop
1640 Tension Band wiring
1715 Bouquet wiring
1800 Close

The morning session was particularly useful and this was a new part of the course we didn't know how it would work. Each exercise was demonstrated by NJ and SG and JH would bring their therapy perspectives for the nuances of treatment. Fortunately we had discussed this part of the course in some detail the previous day and so a consensus view was clearly presented.

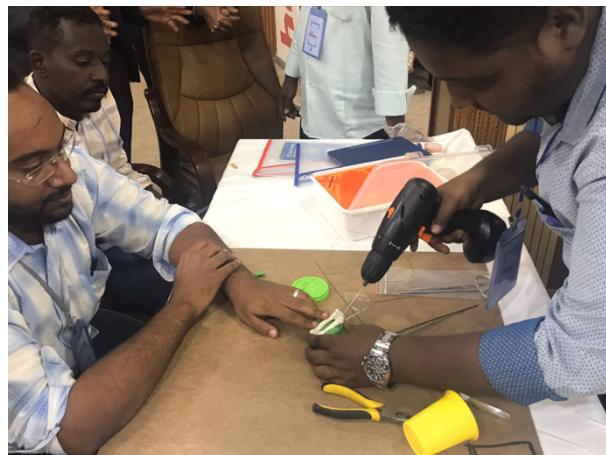


The three lectures were given in the morning as a combined lecture, which flowed well, but the surgical exposures exercise was omitted. This caused a couple of negative comments in the feedback and was a misjudgement on our part. There was some concern that the day would

overrun as it was a very full programme but the day ran fairly well to time, in fact finishing around 5 pm. We considered doing the first exercise of day two to give us more time to see patients the next day, but the candidates were clearly flagging at this point so we closed the day and tidied up.

The afternoon session was led by DB. We had about four delegates to each table, and the idea was that one delegate would undertake each exercise after it was demonstrated. Demonstration was sometimes live, sometimes a pre-recorded video. Both were effective, but the videos were shorter. Tables who managed the exercise quickly had the opportunity to repeat it with another delegate, but we were clear with them from the outset that they had to decide which of them was to undertake which task. We had asked that delegates were of mixed experience so everyone would gain.

The crossed K wire technique was revealing. They all knew that k wires didn't give axial rotational stability or provide compression over a fracture site, yet often their hand fixations were with a single k wire because this is what they had been told to do. This set the tone for applying theory to practise which is what we had set out to do. DB demonstrated a single hand twist technique for the circlage wires, only to be shown a more effective and efficient way the Sudanese did it using the power drill! Learning went both ways.



The sawbones provided an alternative model on which to practise the tension band technique, giving the candidates the option of doing it small, like a finger joint arthrodesis, or larger with an olecranon fixation.

The chicken bone femurs were particularly good for demonstrating the bouquet wire technique, and the wires from Hanson Springs were perfect substitutes for K wires in this exercise (as well as for the external fixator exercise the next day). This was a good way of conserving the k wires as the other exercises would usually allow the wires to be recycled, but here they required bending.

That evening we were treated to a traditional cooked grill dinner. This was hosted by Jafur who was the president of SOSA. We were all given a momento of the course.



Day 3 Wednesday 5th February

DB and NJ returned to Aliaa to continue the hand and wrist fixation course, while SG and JH were taken to Soba hospital to teach about 20 therapists splinting techniques.

Hand & Wrist Fixation Day 2 Aliaa Hospital:

0830 registration and coffee

Part 3 Operative hand fixation techniques 2

0900 Introduction to day 2 10 mins

Demo 10 mins, practical 50 mins

0905 Static external fixation

1000 Hynes and Giddins device

1100 Suzuki frame

1200 **coffee break**

1230 Ishiguro technique Mallet DIPJ + Hastings PIPJ



Part 4 Operative wrist fixation techniques 1

Workstations: saw bones

Scaphoid + carpus:

1255 Perilunate carpal stabilisation, scaphoid fixation, 4-5th CMCJ # dislocations

Distal radius and ulna

1335 DRF, ulnar styloid, DRUJ

1410 Common K-wirings: Bennett's, unicondylar fractures

1430 **Lunch, feedback forms and tidy up**

The day went well, DB led the first part, and as the Ishiguro technique was also suited to the chicken joint model better than the saw bones, this was added in before the coffee break. This gave the opportunity over coffee to tidy away all the chicken bone material and put out the sawbones for the wrist exercises.

NJ led the sawbones wrist session which brought up differences in techniques learnt which allowed discussion of theory and practice.



Feedback forms were distributed and the session was closed. Our cases and equipment were returned to the hotel while we were taken across town to Soba hospital to catch up with the therapists and see the patients that had been brought for our opinion.

At Soba, we were surprised to be introduced to an entourage of politicians, the new generation after the revolution, including the minister for social development. They were very appreciative of our visit, and were not accompanied by photographers which made it seem more genuine.

Therapy Day

SG and JH were met at the Soba University Hospital by the Minister of Social Development and Mr Shadad Mahmoud Surgeon at Soba University Hospital who was the course organiser along with Amnar Aled Elmoniem physiotherapist at Soba University Hospital. We were then able to organise the room provided into a workshop platform for 19 delegates, and had facilities for a projector and to set up all equipment in this area.



The 19 Delegates had an average of 5 years of physiotherapy experience, most of whom treated a wide variety of conditions, as there is no specific hand therapy within Sudan. Most of the therapists work in private hospitals, with very limited experience of managing hand injuries. Physiotherapy is new as a degree in Sudan which was only started in the last 6 years, and of



those attending this training day only a couple had previous training from when JH last visited in 2016. From the feedback from 2016 we were able to tailor the programme with hopefully greater benefit to those attending.

The day was broken down into a mix of lectures interspersed with practical sessions to consolidate the information on the management of complex hand injuries. These sessions were broken down into topics of treatment requirements, prioritising structures injured and balancing multi trauma, healing times and managing pain. We then broke down managing oedema, stiffness and scarring into lecture followed by practical application of techniques taught. We also covered function and outcome measures for later down the line in injuries. This was covered in a morning session; the afternoon was then set aside for splinting, with a lecture on principles of splinting to begin the afternoon and then splitting into groups of 3 to practice pattern taking and application of thermoplastic splinting.

Course questionnaires were given to each delegate and the feedback received was overall very positive with appropriate level of theory and practical sessions being relevant to clinical practice and meeting their personal objectives. General comments were that it was helpful, but more time for practice was required especially regarding the splinting techniques and application. "It was very informative and helpful, but for a couple of days it would be better", "Excellent and found a lot of information that I need and I hope to do all these in physiotherapy in Sudan."



On reflection a greater amount of information prior to attending on equipment available and resources would have enabled us to tailor the programme more accordingly to needs in Sudan. We now have a couple of contacts to be able to do this, as when using POP and K-tape which is available greater progress was made in the sessions. It was also evident through the day that

theoretical knowledge was good but practical application is more limited and therefore an area to focus training needs on. We felt the splinting sessions had inadequate time and resources and on reflection more direct supervision and simpler splints may have been more beneficial. Should further visits be arranged, more time on the practical application of splinting in small practical groups would be beneficial. It was also highlighted limited knowledge of the management of peripheral nerve injuries; this may be a targeted area of improvement.

Clinic Patients

Once the therapists and finished their session with the physiotherapists, we all sat together while a succession of about eight patients were brought for our opinion. It was supposed to be a review of post-traumatic injuries but patients had been sent with a wider range of conditions. Some clinical conditions were outside our immediate expertise, such as obstetric plexus palsy, but even here there were basic steps that could be followed for physiotherapy and splintage as a precursor to operative intervention in the future. We were able to offer advice for the next steps and as the therapists had the splint pan still set up, were able to make some splints immediately, using it as a further teaching opportunity for the therapists.



We were taken back to the hotel after this, had the chance to freshen up before leaving. The post script to the trip was that I was called back from the boarding gate and had to explain to security why I had a suitcase full of bones....

Reflections and lessons learnt

The emphasis on teaching was the applications of knowledge of basic techniques to practise.

The physiotherapy service is in its infancy and undervalued. A physiotherapist is regarded as a nurse with some additional skills. One senior consultant told me we were wasting our time teaching them as they knew nothing, and time would have been better spent teaching the registrars. Physiotherapy is generic with no hand subspeciality interest and there is no such thing as an occupational therapist. Our direct challenge to the younger consultants and the trainees was that therapy was integral to hand surgery, and they needed to raise up the role of hand therapy or their surgery would suffer for it.

This course was the most difficult to prepare for of all the courses we have been part of. Running a course with a lot of kit takes time and a lot of preparation. Unfortunately we only had six weeks and Industry sponsorship was not forthcoming as we had been led to think. We had to plan for sufficient kit for not only this course but the planned subsequent identical course in Myanmar three weeks later. Thanks to Hanson Springs for providing steel rods with k wire properties which served as very good substitutes for several of the exercises.

Any course requiring capital costs needs a specific fundraising as the budget from BSSH and

Bfirst does not include this. We were able to raise over 90% of the costs with GoFundMe. Bfirst have defined a role for trainees on these projects which includes social media. There was an increase in donations with every update posted and this would have been easy to add to the trainees duties. Time was a bit short for us to organise a trainee presence on this occasion.

Finally a word on security. Sudan is in the aftermath of a popular revolution, which had been led by doctors and professional classes. On the streets there was more of a police presence in their dark blue mottled vans and armoured cars parked at most busy road intersections. We were stopped briefly at a checkpoint on the first night. However, generally the mood among the doctors and trainees was one of significant optimism for the future. They hope to see Sudan follow the same path that Rwanda took to stability and prosperity. As before we were made very welcome and at no time felt unsafe. We look forward to seeing Sudan's future.

