EDITORIAL

Expanding the teaching platform

Increasing the number of doctors is a priority in our country, hence the Cuban training programme and the increased intake of medical students in our universities. Equally important are adequately skilled orthopaedic surgeons and other specialists. Our graduates are accepted all over the world because of their clinical skills. Although we still produce, and will continue producing, well-skilled orthopaedic surgeons, our ability to continue to do so is being threatened.

Academic standards

In 2008, the academic standards committee of the South African Orthopaedic Association[1] wrote that '… trauma patients are increasingly displacing elective cases from routine theatre lists. Reduced elective surgery seriously threatens the ability of specialists to train registrars adequately'.

Indeed, a patient requiring an elective total joint replacement will find it difficult to compete for the same list with a patient with a fracture neck of femur. We have not improved much since 2008. If we do things the same way this situation is unlikely to change. As teachers we need to look at ways of making sure we produce specialists of the same standard we are known for.

Two health systems

South Africa has two health systems: the public sector and the private sector. They function parallel to each other.

The public sector provides training for all doctors, including orthopaedic surgeons and other specialists. It has a large patient base that allows trainees to have ample clinical material to train on. All the orthopaedic surgeons in the country are trained through this system, including those in the private sector. The public health system has produced excellent doctors over the years, some pioneers in their fields. The first heart transplant in the whole world came from the public sector. The public sector continues to treat the bulk of orthopaedic trauma in the country, but this is now at the expense of non-trauma, elective orthopaedics.

The private sector is much smaller, more refined, and treats selected patients from a much smaller patient base. Over the years it has grown tremendously, doing most of the super-specialised elective orthopaedic surgery. Indeed some of the surgeons in the private sector are world experts in their fields.

As mentioned, the two systems work parallel to each other. If we want to improve our training we need to expose our registrars to both systems. More importantly, we need to expand the teaching platform to include other forms of training as well.

There are two ways we can expand the teaching platform:

1) The private sector must be involved in the training of orthopaedic surgeons.
2) Use must be made of simulators for the training orthopaedic surgeons.

The private sector

We need to get the private sector involved in the training of orthopaedic surgeons. Each training institution needs to identify areas where their training programme is deficient or where it might be augmented. The registrar would then attend that practice and observe the procedures that his training programme is deficient in.

We need to expose our registrars to both systems

Admittedly this attachment involves only assisting, but repetitive assisting helps one understand the procedure and the trainee would be able to move to the next stage of training, namely operating under supervision. Some training programmes are already making use of this method of expanding the teaching platform. It is however being done haphazardly, and perhaps illegally.

Registrars are employed by the provincial government, and have strict employment contracts. The hospital administrators want all their employees (including registrars) to be at their allocated posts of service delivery all the time. We need to engage our hospital administrators on this issue. They need to realise that if we are to improve service delivery, we need to improve training as well. We will have to prove to the provincial governments that we can do this in a regulated manner, and much better than we have been able to manage RWOPS (Remunerative Work Outside the Public Service). We also have to show that there is benefit as far as training is concerned, that will in turn improve service delivery.

The practice that has been identified for training may need to be accredited by the registering authority, the Health Professions' Council of South Africa, as a training centre, just as the public hospitals have to be accredited as such in order for them to train doctors.

Research is becoming an important part of our training. Data collection continues to be a major problem in our public hospitals because of irretrievable records. The private sector is much stronger than the public sector in this regard. Expanding the teaching platform to include the private sector will improve the research output of the department concerned.

Simulators

The second method of expanding the teaching platform would be to use simulators[2] to improve the practical skills for both the procedures we do in the private sector and for the procedures we do not get good exposure to in the public sector.

Orthopaedic surgical procedures have become more hi-tech over the years. With the increase in medical litigation, it is important that by the time the surgeon has to do an operation in theatre, he/she is adequately trained. The concept of 'see one, do one, teach one' is no longer acceptable, and it is pivotal that the surgeon has adequate technical exposure to surgical procedures during his/her training. The figure attached to adequate exposure in a technical skill is still elusive, but what we do know is that repetitive behaviour improves technical skills. Simulators provide us with the ability to perform these skills repeatedly.

Simulators are widely used in education in general. They range in fidelity or realism from hi-tech virtual cockpit flight simulators used to train airline pilots, to the inert sand bags used to train professional boxers. In simple terms a simulator is a person, device or set of conditions, which attempts to present problems authentically; the fidelity (or exactness of duplication) of the simulation is never completely isomorphic with the real thing. The limiting factors are costs, limits of engineering technology, academic design, ethics and time constraints.[2]

Challenges in service delivery issues have been triggering the shift of medical education methods to simulators.

The main trigger for the shift to simulation training in our country is the constantly decreasing exposure of our registrars to elective surgical procedures, because of the increased trauma burden.

The second reason is the new techniques in orthopaedics. Techniques such as arthroscopy, joint replacement and pedicle screw placement are best learnt in a simulation environment, before they can be practised in the operating theatre.

The third reason is avoidance of medical errors and patient safety.

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The AO Basic Course for fracture fixation is the best simulator example that we have in our training programmes. There is no doubt that, after doing the course, registrars have a much better understanding of the concepts involved in the AO school, for instance compression of fractures, lagging of screws and tapping of screw holes. There is no doubt that these skills are best learnt on a simulator, so that by the time registrars have to do the operation in theatre, they only have to contend with issues of access to the bone, rather than the technical aspects of the plating procedure. Not only should the academic departments send their registrars to such a course, they must also have skills laboratories in the departments for the registrars to perform these skills repeatedly.

Arthroscopy is a skill with a steep learning curve. Triangulation and 3-D perception are skills the registrar needs to learn. The old method of learning these skills from the consultant in the theatre is not the best way. There are now very well manufactured plastic simulators where one can practise these skills, again best done in a department's skills laboratory.

The use of simulators as an educational tool has been evaluated in orthopaedics. Tonetti[3] evaluated a simulator for percutaneous iliac screw insertion and found it to be a valuable tool in training orthopaedic surgeons. Joseph *et al*[4] described the value of using models to teach registrars the complex movements and functions of the subtalar joint.

Cadavers

Training using cadaver simulation is perhaps the closest to the real operation. It is what we should all be aiming for to train our registrars. Cadaver training is already being used in some centres in our country, and the trend should spread to those centres are not yet using it. It should be extension of the teaching that the orthopaedic departments provide. The anatomy departments have to come closer to the clinical departments for us to be able to provide this type of training to our trainees.

Cadaver training has been evaluated by various authors. Kuhls *et al*[5] reported on cadaver training for trauma surgical registrars. They concluded that cadaver training improved the registrar's time in exposing vital structures in acute abdominal surgery. In clinical rheumatology,[6] a study was done where rheumatology registrars were taught arthrocentesis of various joints using cadavers, anatomical models and picture charts. Although all these teaching interventions were helpful, the study concluded that cadaver training was the best method of teaching the registrars arthrocentesis.

There is no doubt that in orthopaedics, cadaver simulation is a very good teaching method. We have seen it in our unit, rather anecdotally, in those registrars who have been fortunate enough to attend a cadaver training course in arthroscopy and in spine surgery offered by other institutions.

It is a learning platform that we should increasingly use in our country. Superficially there is no shortage of cadavers in our country, but of course there are factors that make them not universally available, notably the ethics of using human tissue for teaching, and cost.

With the constraints we have in accessing cadavers, it is encouraging to note that, at least in the skill of arthroscopy, synthetic joint models perform just as well as cadavers in teaching registrars.[7]

Conclusion

In the wake of the challenges we have in our health system, we need to expand the teaching platform in order to maintain the standard of the orthopaedic surgeons we train. We can do this by involving the private sector in the training of orthopaedic surgeons, and by using simulators in all our training programmes for selected skills.

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