

Introduction

I have been interested in the care of burns patients since beginning my registrar training in 2006. I am convinced that burn injury is a neglected health care issue in South Africa. I was privileged to be awarded the travelling fellowship bursary from ASSA in 2011. This provided a valuable opportunity for me to visit a world-class burn care facility. I also feel that it demonstrated the understanding of the South African surgical fraternity for the need to improve burn care.

Background

Concord General Repatriation Hospital is a war veteran's hospital situated in Sydney, Australia. The burn unit was started in 1979. A local plastic surgeon was sent for training in burns to the McIndoe Burn Centre in Queen Victoria Hospital, East Grinstead, England. The objective was to develop an area of specialization to attract funding in the changing environment of a war veteran repatriation hospital to a general state hospital. Starting out as a 3 bedded burn unit and growing in expertise and facility, an Austrian plastic surgeon, bored with aesthetic surgery and in need of a clinical challenge, came over to Concord in order to take it to a higher level. Today it is a 16-bed unit, with a skin research laboratory adjacent, and is now a centre of excellence. The tipping point to their success was the international disaster of the Bali bombings. This attracted much media attention and thus public scrutiny and then political interest and drive for funding which is often the vehicle for improvement.

(Lesson: circumstance affects the direction of growth in a specific field – hospital financial interests and political drive and media are essential components for development, not withstanding the extreme dedication of individuals)

Systems

I was surprised that interest in burns across the surgical fields in Australia is as miserable as it is in South Africa. Burn injuries are mostly managed by plastic surgeons that make a lot of money doing both cosmetic and reconstructive work. They spend limited time in the state hospitals as visiting medical officers, and therefore there is an inconsistent burns service. Management of burns requires constant and consistent clinical input and thus it became a service largely run by nursing staff, due to their daily presence and continuity of care. A career in plastic surgery is most often lucrative and the applications for a registrar jobs are countless. The head of the Concord Hospital Burn Unit is quite unique as he is a burns focused plastic surgeon, and he utilises this situation to his advantage. He assures a training post in plastic surgery following a year's medical officer job in the burns unit and because of this incentive there is an ongoing supply of junior doctors to the unit.

(Lesson: create a sustainable flow of trainees through the unit)

Bar 2 of the 16 burn units in Australia; all have visiting consultants in the head of department position. Most of these plastic surgeons perform other plastic surgery within the state hospital as well as private practice. A medical director post at Concord burn unit was created and allocated to someone whose exclusive role was running the burns unit. This finally resulted in a consultant led service which defines the difference in care between other units. Notably, the consultant is always in theatre and is the only one to use a humby knife. This is contrary to the typical scenario at home where debridement and skin grafting is considered mundane for most consultants and left to registrars or more junior staff. An experienced burn surgeon is crucial in debridement surgery as swiftness is important for both haemostasis and temperature control in large burn injuries.

(Lesson: dedicated burns clinician is essential)

Due to the traditional circumstances of burn units being managed by nurses, there is a significant foundation of experienced, driven nursing staff, as well as therapists. Units tend to be well staffed, and this allows time for more studies, research and quality improvement projects. There are, in general, high levels of education and comparatively low levels of clinical workload. Another unique concept to Concord hospital is that staff has been trained to perform different roles, for example working as scrub nurses, anaesthesia and theatre nursing assistants, as well as rotating through the outpatient clinic and the wards. The same group of staff is involved in each phase of the patients care. This provides continuity of care for the patient, but also a unique set of skills and knowledge that give the staff perspective in the total management of burns.

(Lesson: A large skilled nurse base is vital. Interchangeable skills allow wide use of staff and more effective overall management in the unit.)

The network manager for burns contributes to a well functioning service. She oversees the functioning of the 3 specialised burn units in the state of New South Wales. She is involved in burn prevention, development of best practice/guidelines, and teaching. She is a patient advocate as well as someone representing medical, nursing or allied health issues, and dealing with both hospital administration and the government. She is responsible for the collection of data and the building of a database across the service.

(Lesson: administrator working exclusively in burns with the interests of all parties involved leads to growth of that discipline, and allows clinicians to focus on the clinical work)

Costs

A 24-year-old girl gets caught in a bush fire while running an ultra marathon. She sustains 64% full thickness burns to her face, entire arms, hands, legs and buttocks. She is well resuscitated and transferred within 48 hours to the Concord burn unit where young people with massive burns rarely die. The story is well covered by the press, with journalists visiting the hospital to follow her progress. She is taken to theatre on day 3. The 3 anaesthetists, 5 surgeons and 6 nursing staff are sweating in the 30-degree theatre. She undergoes an extensive and complete excision of all burns wounds. There is extensive blood loss. Experienced consultants do this in minimal time, essential for her survival. The wounds are covered with skin substitute and a topical antimicrobial. She returns to ICU for ventilation. Two days later she is septic and goes back to theatre for another massive debridement of the burn wound. Still no skin grafting can be done due to the sepsis, and Acticoat® remains the topical silver therapy of choice. With the remaining large surface area “uncovered”, referring to a burn that is excised, with no autograft, allograft, or synthetic skin substitute in place, she remains in a hypermetabolic state. Cadaver allograft is usually available and considered superior due to the retained immunogenic properties not duplicated in synthetic counterparts. All of Australia’s supply was in New Zealand for the Rugby World Cup Disaster plan, and therefore supplies were flown in from the USA. Over the next 3 weeks she has sequential operations of finger amputations and autografting. Eventually she starts the long road of rehabilitation: learning to talk, eat and mobilise. It is really only the beginning for her.

(Lessons: 1. Large burns consume extensive amounts of blood products and will most likely be the limiting factor in the management of major burn injury in South Africa. 2. Sepsis remains the constant risk and is common in burns, even in established units. 3. Coverage of the wound is vital and we should explore avenues of cadaver skin in South Africa)

Survival is no longer a measure of success in burn patients, rather it is the quality of life of survivors. The scarring is devastating and disfiguring. These factors give rise to the ethical issues surrounding management of major burn injuries and drives further research into techniques and

products for managing the burn wound, for example cultured epithelial autograft and living skin substitutes. A large part of funding in a unit like Concord goes into research and 2 scientists are employed for exclusive burns research, just in this hospital alone

With the dismal follow up in South Africa, we don't appreciate the extent of devastation that comes from disfigurement and disability of the burn patient. It was thought provoking to meet two major burns survivors. Two young adult survivors of about 80% burns, both experienced horrible accidents 2 years previously, and both with incredible family support. The burn scarring in both is significant, with hands in varying degrees of amputation, but functional. The young man has no burns to his face, and interacts like any young guy. The young woman is an emotional wreck, with not horrendous, but not insignificant facial burn scars. The difference in "outcome" made an extreme impact on me.

(Lesson: In my opinion, most important quality of life indicator is the presence of facial burns.)

Ethical considerations

This brings to the fore the ethical question: Should we save patients with massive burn injuries? In a resource rich and highly litigious medical system, I think there is very little question. The capability exists, patients are few, and maximum care should be utilized. The answer for us in South Africa is a little more complex as resources are limited and patients are many. There are a limited number of beds, limited blood supply, and a multitude of difficulties surrounding the undertaking of rehabilitation. To consume our resources on a few patients with very large burn injuries who will have a very questionable quality of life is not valid. The focus should be injuries that have a good chance of survival and a better outcome if we treat them appropriately, for example the children with scalds of 25%, the adults with small but crippling injuries to hands and legs and faces.

(Lesson: ethical issues are very controversial surrounding burns and depends on the environment in which you work)

Miscellaneous

1. Even in an advanced and well running, well-funded unit, dealing with human nature issues like personalities and egos remains challenging. This translates into clinical problems such as: no ventilated beds in the burn unit, although there is a theatre in the unit, it only has one operating list a week, and other patients go on the emergency board or other plastics lists in main theatre. This is problematic as the set up is not burns specific and the theatre staff is not experienced in burn surgery. Lastly, the burns service is divided among three hospitals in New South Wales, and it would be more efficient for the load of patients to be centralised in one unit.

(Lessons: 1. There are politics wherever you go. 2. A few centralized units is a much more efficient allocation of resources)

2. Part of the current medical system in Australia is the allocation of each problem to a different person or team with a specialised set of skills and knowledge. Unfortunately this seems to be detrimental as there are many parts that run independently and in parallel. There is little teamwork, communication and sharing of knowledge, and the benefit of the multidisciplinary team is lost.

(Lesson: To ensure better burn management, you must have an understanding of all the various components, and it is the senior role to ensure teaching and exposure of junior staff to equip them with the necessary skills. This applies particularly to South Africa, where one doctor will be responsible for many components.)

Annual Scientific Meeting

ANZBA was formed in 1976, as a coalition between Australia and New Zealand. Their annual conference invites some international speakers from Asia and America, as well as local, but largely local delegates attend it. It is a meeting that incorporates all fields of burn care from scientists, and surgeons to nurses and therapists. It is remarkable how many nurses and therapist present their PhD work. The concept of Prevention was a significant focus this year, with one of their local experts on prevention, a general surgeon with a keen interest in that area. His advice is enforced legislation, and where campaigns are done, they should be: focused; aim for a specific target group; repetitive; shocking but with a positive end; best done by a burn survivor. The effects though only seem to last for 6 months, so should be ongoing. Prevention in South Africa would obviously need a different approach, as we deal with so many social problems rather than people causing self-harm as an injury profile, for example, young guys throwing petrol on a fire, which is extremely common in Australia. We are desperately lacking focus on burn prevention.

The other large area addressed was analgesia, particularly in children. The local practice has a variety of different techniques including the use of virtual reality helmets, play therapists, distraction techniques and digital games. Some units have dedicated anaesthetists or pain teams. The use of Nintendo Wii in the rehabilitation phase to improve functional range of motion, with 3 dimensional digital assessment of baselines, limitations and improvements is fascinating.

The bi-national registry presented their first year's data. This has been due to 5 years worth of work by the person allocated this role, as well as significant funding for establishment of this database.

Because there is now a well established standard of care in first world medicine for burn injuries, survival no longer becomes the absolute outcome, and there is a phenomenal amount of scientific research being done to improve morbidity, particularly better scars. There are numerous and substantial projects looking at dermal substitutes and complete skin substitutes. South Africa remains very far from this end of the spectrum, still needing to focus on improving survival!

For me the most interesting part of the meeting was the debates. Australia is so large that each of their states is very independent, resulting in a variety of practices in each of the burn units. I thought that the debates were duly fitting, and were well put together but still humorous and illustrating the varied opinions.

It ended with all the keynote speakers addressing the meeting for 10 minutes each to present their futures visions of burn care advances that may be near current reality (like the growth of a complete skin substitute with varying degrees of pigment of hair) to the wild (like an "intelligent" dressing that sends a text to your phone to say that the bacterial load is increasing and you can remotely program the release of the appropriate agent into the wound!)

Proposal

In summary my proposal for the future of burn care in South Africa includes:

- The generation of political and public interest in the current state of burn care that is overshadowed by the burden of infectious diseases like TB and HIV.
- Development of centralised units with appropriate infrastructure and standard referral patterns, with established management guidelines.
- Initiation of specific education to train and retain multi-skilled and dedicated nurses in the field of burns care.

- Consolidation of the idea that burn units should be closed units, run with critical care principles and with the capacity for ventilation and “in-unit” theatre dedicated only to burns.
- Attraction of doctors to the field by improving their working environment, offer of good training, and research opportunities.
- Shifting the current conservative local thinking to that of the international standard of early excision and grafting being the only way to improve survival, and the development of local means to achieve this.
- Establishment of multidisciplinary teams with adequate exchange of information and maintaining cohesiveness.
- Secure available allograft by the development of a national skin bank, which is a much more affordable and superior option to synthetic substitutes.
- Instigation of a national database as an epidemiological resource as well as research base.

However there are numerous barriers to achieving this that I realise are of a significant magnitude:

- Doctor and nurse disinterest as burns care is often considered non-rewarding ‘dirty work’.
- Poor skill and education levels across the spectrum of doctors, nurses and therapists.
- Extreme shortage of human resources.
- Costly problem to manage in terms of blood, dressing products and infrastructure.
- Lack of political and health department priority.
- Resistance to change.

Conclusion

In my naivety I expected to find solutions to all of the difficulties I have encountered managing burns patients, particularly the large surface area injuries. It was with part relief and part despair that I realised my problems and difficulties are universal... they are the nature of the burn injury rather than a shortfall of where they are managed.

Atul Gawande, in *Better*, exposes the “challenges that keep doctors from being their best in an environment where a simple act like hand-washing is a life-and-death issue. It turns out, surprisingly enough, that the secret to doing “better” isn't more research, or new technology. It's finding ways for doctors to make better use of the knowledge they already have”.

This is particularly pertinent in South Africa, and a little does a lot more than we think. By just getting the basics right we can make meaningful inroads into the current challenges and make a start along the road to better burn care.