

‘Boston’ skin cloning an exception – burns surgeons



Three top burns-unit surgeons say costly cultured epithelial autografts (CEAs) ‘ordered in’ from the United States for less-than-critically burnt patients should not become the norm, because far cheaper, well-researched and equally effective treatment methods are freely available locally.

The burns unit chiefs, who oversee the treatment of most child burn victims in Gauteng and the Western Cape, are worried that the heart-wrenching, miraculous recovery from 80% third-degree burns of Pippie Kruger, 3, of Ellisras, will become a ‘public reference point’. A 2 cm x 6 cm biopsy swatch of Pippie’s skin was cloned by Genzyme in a laboratory in Boston, Massachusetts, for R783 000, and successfully grafted onto her body six months after a gel firefighter exploded in her father’s hands at a 2011 New Year’s Eve braai. She has survived five heart attacks, kidney failure, pneumonia and 46 operations, becoming a national celebrity and inspiring a burgeoning trust fund, set up by her mother, Anice. More recently, the fund footed a R423 000 bill for a 20 cm x 20 cm Genzyme cloning biopsy swatch to help five-year-old lesser-burns victim, Celiwe Maseko, whose dress caught alight, scorching her chest, abdomen, buttocks and rear thighs and leaving near-third degree burns over 35% of her body on 4 January this year.

Both surgeons said the issue boiled down to cost effectiveness of treatment, stressing that money raised or spent would be far better used and save more lives by increasing treatment capacity for burn units routinely overwhelmed every winter.

Dr Ridwan Mia, the local surgeon in both cases, worked on both children at Garden City Hospital in Gauteng. He explained the price difference by saying they had negotiated the cloning for Celiwe ‘down to the lowest possible price’. Speaking the day before applying the swatch to Celiwe (24 April), he said it would be her 18th procedure. ‘The back of her thighs have

healed, as have some partial thickness burns to parts of her face, chin and legs – but her buttocks, abdomen, back and chest wounds are open, clean and granulating.’ By 2 May 90% of Celiwe’s grafts had taken, and Mia said it would require ‘meticulous dressing care’ over the ensuing two to three weeks before she could be discharged.

‘Boston option an unrealistic reference point’ – Rode

However, as Red Cross Hospital burns unit veteran Professor Heinz Rode explained, ‘Our concern is that should this [the ‘Boston option’] become a reference point for less-than-critical burns, it will distort the management of burns in this country, to the detriment of the underprivileged.’

Dr Wayne Kleintjies, a former private-practice burns paediatrician and newly appointed head of the Red Cross Hospital burns unit, said standard practice for full thickness or partial thickness burn areas is to remove all dead tissue and graft skin on as quickly as possible. Areas that had not ‘epithelialised’ within 14 days are usually skin grafted using donor sites and repeat skin harvesting, the aim being to achieve closure as early as possible. ‘The basic principle of burn management is that if you have areas you can harvest from, you do – what you don’t want is open wounds after several months.’

Responding to criticism for choosing the expensive CEAs instead of skin grafts from unaffected and available areas of Celiwe’s body, Mia said both sets of parents pleaded with him to avoid any further scarring, however minor. ‘I agree fully with what my senior public sector colleagues are saying – I trained under two of them. But these are very special circumstances. These patients were dependent either on the state or on medical aid and it’s not necessary or right to ask money from them [when there’s a healthy fund available].’

He agreed that he could have taken skin grafts from Celiwe’s thighs and part of her back, but quoted her parents’ response to such a suggestion as, ‘Oh, my God, you’re pretty much going to scar the whole of her body!’ He added, ‘Instead she’ll now be able to wear a one-piece bathing suit over her scars and you’d never know.’ Mia emphasised that he treated the ‘vast majority’ of his cases exactly as his public sector colleagues and mentors did.



Award-winning burns surgeon, Dr Ridwan Mia.

Dr Adelin Muganza is head of the Chris Hani Baragwanath Johnson & Johnson Burns Treatment Centre and President of the South African Burns Society. He and Kleintjies agreed with Professor Rode that full thickness burns under 75% of total body area are manageable locally. Said Muganza, ‘If anyone has less than that without smoke inhalation injury (smoke inhalation is primarily a factor in adult cases) and we use what’s available with skin substitutes, then our capacity is comparable with anything overseas. What we’re against is sending a public message that we can save all patients above 75%. Since the Boston autografts were publicised, we’re under pressure to accept even 100% burns – it’s totally unrealistic.’

Public sector incapacity costs lives every winter

Both Muganza and Kleintjies said the issue boiled down to the cost effectiveness of treatment, stressing that money raised or spent would be far better used and save more lives by increasing treatment capacity for burn units routinely overwhelmed every winter. Muganza said his unit, which sees 500 children (mainly with water burns) and 250 adults (mainly with more serious fire burns) annually, is forced to refer half the adults outward to trauma or general wards, followed by peripheral hospitals, every winter.

‘You end up with a situation with the unit full of 60% burns and referring out the 25% burns, who often don’t make it,’ he



Professor Heinz Rode of the Red Cross Hospital Burns Unit.

added. Kleintjies said that for the price of one 'Boston-type' cultured epithelial skin autograph 'you can help 1 000 other patients locally. The cost efficacy of the technology is just not appropriate for us.'

In South Africa burns are the leading cause of trauma-related death for children

under the age of 4, and the third greatest cause of trauma-related death for people under 18. Red Cross Children's Hospital is the only southern African facility using 'spray-on' CEAs,^[1] although other hospitals can purchase the technology from Australia, including a dramatically improved, but more expensive, CEA process that takes just 20 minutes to prepare. If there is sufficient donor site, surgeons stretch the skin up to six times to create the mesh and then fill the gaps with spray-on skin. The meshed skin acts as an effective protective template, as the proliferating cells are prone to mechanical trauma on their own.

All three public-sector surgeons emphasised that the use of the 'Boston' option comes down to patient choice, should someone suffer massive life-threatening burns and there are no other techniques to cover the body surface with epithelial tissue. 'It's their prerogative, but it's phenomenally expensive and many people become disillusioned if it doesn't work,' added Kleintjies. However, Mia said he wasn't aware of any treatment failures in the Genzyme patient cohort.

The surgeons all agreed that there was a dire need for a cadaver skin bank in South Africa and that while the Burns Society

is spearheading attempts to establish one, funding is needed.

It is estimated that only 6% of burns patients consult the private sector; the majority are cared for by various provincial public sector facilities. About 3.2% of South Africa's population suffers thermal injuries annually, the vast majority from low socio-economic communities. Contributing factors include haphazard urban development, inadequate electrification of homes, paraffin use as a primary energy source, lack of education (especially maternal) and the failure of preventive programmes.

On 26 April Dr Ridwan Mia was awarded the Order of the Baobab (Silver) by President Jacob Zuma for his 'excellent contribution to the field of medicine and for giving hope to victims devastated by burn injuries'. His reconstructive surgery on Pippie Kruger was the first involving cloned skin in Africa.

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1. Bateman C. Australian surgeon's tenacity more than skin deep. *S Afr Med J* 2008;98(4):246-248

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