If Life Begins at Forty…what about Dentistry?

by

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Abstract

As he approaches his 40th year of clinical practice, Peter Thomson reflects upon a professional lifetime as a clinician, surgeon, teacher and researcher. His clinical expertise as an oral oncologist and his research work in carcinogenesis and interventional management of potentially malignant disease has taken him on an international journey spanning the UK, Singapore, Hong Kong and Australia. Taking time to reflect on his career to date, he poses the fundamental question: if life truly begins at forty, what about Dentistry?

Introduction

Carl Jung, the influential 20th Century psychoanalyst, once opined that life should only be considered to truly begin at forty years of age, with everything up to that point merely preparatory research work. I must admit, as a clinician and researcher, I do empathise somewhat with this perspective. Much to my astonishment, however, I now find myself rapidly approaching my 40th year of clinical practice in dentistry and health sciences research (Figure 1).

It was in September 1978, that I commenced undergraduate studies at the Turner Dental School at the then Victoria University of Manchester in North-West England. Little did I know then, what an amazing and rewarding international adventure was about to begin. It feels particularly pertinent to pause for just a moment to reflect upon those 40 years since first qualifying BDS in December 1982. I hope FDJ readers will indulge me a little!

Like many of us, I find it rather difficult to reconcile just how quickly the time has passed and how many of the events of 1982 remain so vivid in my mind. It was the year in which Prince William was born, Channel 4 Television was first broadcast in the UK, Stephen Spielberg's 'ET' was one of the most popular films at the box-office, and Argentina invaded the Falkland Islands. The ensuing South Atlantic conflict providing an especially distracting and concerning backdrop, and much animated conversation between us I recall, whilst my colleagues and I sat the first part of our Final BDS exams that June.

Leading up to our December graduation, we undertook a personal study/research project and practised comprehensive dental care in a rather prescient 'vocational training course' within the University Dental Hospital. I still remember the increasing excitement, and a little anxiety, as we approached qualification and first registration with the GDC.

Why Dentistry?

Even today, I remain unable to explain exactly why from an early age I always wanted to be a dentist. Strange in many ways because, like many children growing up in the 1960's I suppose, I did not particularly look forward to attending as a dental patient or undergoing treatment at my local practice, despite the consummate skill and consideration I always received. Perhaps it was, indeed, the evident professionalism of my own dentist that catalysed my personal interest and enthusiasm for considering dentistry as a career. To be able to offer specialist knowledge and advice and to provide skilled practical help to people in need was I think what attracted me most about practising as a dentist. It still does to this day.

Surgical Exposure

During the BDS course, I particularly enjoyed pathology and clinical medicine and surgical subjects, although never held any aspiration to become a medical practitioner. In my senior student years, as I gained fledgling experience within highly regarded oral medicine and oral surgery teaching departments, I recognised I was developing an interest in oral cancer and the diagnosis and management of those fascinating and confusing oral mucosal lesions deemed to be potentially malignant disorders (PMD). Little did I know then, just how much these interests were to occupy my future professional career.

The Manchester oral surgery course in those days was a highly structured 'internship', delivering both out-patient and in-patient surgical experience, and was based extensively upon Professor Moore's famously concise and detailed textbook; I still recommend the up-dated version of this book to our undergraduates today[1]. It thus seemed inevitable that the specialty of oral surgery, especially in an academic environment, became my chosen career, combining the subjects that interested me most in a particularly challenging and proactive manner. Somewhat ironically for me, 1982 was the year that 'oral surgery' formally transformed into 'oral and maxillofacial surgery' in the UK, confirming a much broader and more complex range of head and neck surgical practice and appropriately mandating both dental and medical qualifications for specialist training.

The die was well and truly cast. Whilst undertaking my first job as a Dental Hospital house officer at Manchester in 1983, I applied and was accepted to study medicine at the University of Newcastle upon Tyne, ultimately qualifying MBBS in 1988. As a 'mature' student, I found undergraduate medical studies less demanding than dentistry; the latter, of course, requiring significant clinical and practical skill acquisition in addition to knowledge retention, and I was fortunate to have a little time, primarily during evenings, weekends and university holidays, to practise part-time as a general dental practitioner in a busy and well-regarded practice within a small mining town in County Durham. Looking back at those busy and fulfilling years, it is impossible to over-emphasize how much experience I gained and how much I learned about clinical dental practice; quite simply, invaluable 'real-world' experience for the would-be specialist.

First Academic Steps

In 1989, after pre-registration medical jobs in Newcastle, I was offered a post as a junior lecturer in oral & maxillofacial surgery back at my alma mater in Manchester. This was the start of my clinical academic career and an exciting time for a young clinician, as I joined a successful and expanding academic surgical department. During this period, I experienced the complex challenges of balancing teaching and research activities with my clinical training. Indeed, it was whilst lecturing at the University of

Manchester that I truly recognised the significance of effective knowledge dissemination, and in helping to both tutor and mentor our next generation of dental practitioners.

During this period, I have especially vivid memories of attending Lincoln's Inn Fields in January 1990 to sit the examinations to gain my Fellowship in Dental Surgery thus beginning my career-long association with the Royal College of Surgeons of England. Ultimately enrolling as a higher surgical trainee, and with more examinations to follow, I was fortunate to learn from several skilled oral & maxillofacial surgeons practising in the North-West of England. As my clinical training continued, oral cancer and head & neck oncology became my particular focus and abiding interest.

In what was to prove a significant career development, a senior colleague in Manchester at the time introduced me to research opportunities at the Paterson Institute for Cancer Research at the renowned Christie Hospital. Here I discovered the fascinating science of epithelial cell kinetics and was welcomed as a novice to laboratory research by renowned cell biologists. How they ever tolerated my disruptive, part-time forays into oral carcinogenesis research I will never know, but these astonishingly generous scientists supported and guided me to complete research degrees in oral epithelial biology; I owe them an enormous debt[2].

Our initial studies confirmed a substantive and fundamental distortion of oral epithelial cell proliferative behaviour in response to exogeneous carcinogens[4]. Fascinatingly, such changes appeared concentrated at those anatomical sub-sites within the oral cavity most prone to cancer development, such as the floor of the mouth and ventral tongue, suggesting an inherent site-specific predisposition existed in the human oral cavity to malignant transformation[5,6]. It was the beginning of a research journey to quantify cancer risk and develop early-stage interventions for patient treatment.

Oral & Maxillofacial Surgery in Newcastle

By 1996 I had completed my specialty training and, rather unexpectedly, was encouraged to apply for the newly established Chair in Oral & Maxillofacial Surgery in the School of Dentistry at Newcastle University. I was interviewed and appointed to the post that Summer, with the prescribed remit of re-invigorating the academic department and developing oral cancer research and teaching.

High rates of oral cancer have always existed in Northern England, unfortunately, with the general health of some 300,000 people living in the city of Newcastle upon Tyne reportedly worse than average for many UK parameters, including a reduced life expectancy, high levels of adult smoking and smoking-related deaths, and significant rates of alcohol-related disease and hospital admission. Whilst an average of 70 new cases of oral cancer were known to occur each year in the region[3], no data existed at all at the time to document either incidence or prevalence of PMD.

Whilst surgical training had highlighted the devastating morbidity and mortality consequent upon late-presenting, advanced-stage oral cancer, reliable identification of individuals at 'high risk' of oral carcinogenesis, the early diagnosis of malignancy and approaches to managing PMD were all areas in which variability in decision-making and lack of high-quality evidence confounded contemporary treatment initiatives.

Two fundamental questions crystallised to advance oral oncology research in Newcastle:

1. Could improvements in diagnostic technique identify those individuals at 'high risk' of cancer development, and better characterise the spectrum and behaviour of pre-existing PMD?

2. Was there an effective interventional management protocol that could halt the progress of oral carcinogenesis to reduce morbidity and improve treatment outcomes for patients?

To address these issues, and in parallel with our developing practice in head and neck oncology, a dedicated clinical service for PMD patients was established within Oral & Maxillofacial Surgery at Newcastle. From tentative beginnings, we progressed to managing nearly 1000 patient attendances each year comprising both new patient referrals of suspicious oral lesions and the long-term follow-up of previously diagnosed and treated cases. A specific treatment protocol was developed, based upon early identification of PMD, interventional CO_2 laser surgery to remove or ablate 'high risk' mucosal lesions, improve reliability of histopathological diagnoses via excision biopsy analysis and facilitate early diagnosis and treatment of 'occult' carcinoma[7,8].

A structured patient follow-up and active surveillance regime not only confirmed the efficacy and reliability of these minimally invasive, low morbidity treatments but also enhanced our understanding of the natural history of PMD, helped identify patient sub-groups at risk of recurrent or further PMD disease, ensured recognition and modification of risk factor behaviour, highlighted the significance of multiple-lesion presentation and developed new clinical techniques including 'field mapping' biopsies to identify and treat the most significant sites of widespread mucosal disease[9-14].

In conjunction with an ever-expanding team of dedicated and innovative post-graduate researchers in Newcastle, we conducted further epithelial cell biology studies that helped identify the highest proliferative cell indices in PMD lesions at risk of malignant transformation, enhanced our ability to predict poor clinical outcomes for PMD patients and delineated the extent of field cancerization effects within the oral cavity[15-19].

In 2009, it was an honour to be appointed Hunterian Professor at the Royal College of Surgeons of England, followed in 2011 by a King James IV Professorship at the Royal College of Surgeons in Edinburgh in recognition of Newcastle's research and clinical work in oral oncology and the advancement of surgical care. In 2012, I edited and published a new textbook detailing the contemporary management of PMD[20], followed later in 2019 by a volume detailing our preventive and interventive techniques in oral cancer treatment[21].

Successful research leads to discovery and, hopefully, to incremental growth in both knowledge and understanding. The impact of new knowledge or improved management protocols can only be judged, of course, by their long-term influence on clinical outcomes. Instigating change in established practice takes time, often decades, with delays in information dissemination, clinician reluctance to alter established decision-making, cultural influences favouring preservation of status quo, and resource implications all acting as principal detractors of change. It was becoming clear to me that many of these limitations in addressing the needs of individual patients might be better addressed by targeting the populations most at risk of oral cancer development.

International Perspectives

It was in 2002 that internationalization began to feature more strongly in our work as we joined a major, Europe-wide epidemiological study to stratify risk assessment for oral cancer development, especially in relation to lifestyle habits, dietary factors and occupation; this was the Alcohol Related Cancers and Genetic susceptibility in Europe (ARCAGE) study and our first real foray into population research. Ultimately, this project examined data from 2304 head and neck cancer cases and 2227 controls from 15 centres in 11 European countries, adding significantly to our understanding of the epidemiology and aetiology of oral cancer[22]. After some years of continuing and productive research, we became part of the even larger International Head and Neck Cancer Epidemiology (INHANCE) consortium, which together collated data from 14,520 head and neck cancer cases and 22,737 controls[23]. These were indeed exciting times, with ‘big data’ sets to analyse, providing outstanding opportunities to advance our knowledge and understanding of oral carcinogenesis.

During a particularly insightful annual job appraisal in 2013, I remember being required to address the topic of career longevity and realised, somewhat uncomfortably, that this was an issue I had not previously considered or perhaps, to be more honest, had simply chosen to ignore. After some deliberation, therefore, I seized a rare opportunity offered during the Summer of 2014 to take sabbatical leave from Newcastle to spend a term as Visiting Professor at the National University of Singapore’s Faculty of Dentistry. Enjoyably, and quite spectacularly, this expanded my global view of dental education, clinical practice and research.

Looking back on this now, I realise just how much my Asia-Pacific experience altered my whole outlook on my professional life. During 20-years in Newcastle, I had developed, staffed and helped lead a modern and innovative clinical academic department, mentored young colleagues to develop their clinical, research and managerial skills, and worked to deliver better integration of clinical services with teaching and research. It felt time to ‘hand-over’ to the next generation, to embrace professional renewal and to embark upon a new challenge.

In April 2016, therefore, I took a leap of faith and joined the University of Queensland's School of Dentistry in Brisbane as Professor of Oral & Maxillofacial Surgery and Academic Clinical Director; an exciting move tinged, of course, with sadness as I left family and friends, professional colleagues and my patients behind in the UK. The newly commissioned Oral Health Centre, located at the University's Herston campus, possessed the most modern dental facilities I had ever seen, and it was a pleasure to teach and practice there. Within a year, I was asked to take on a new role as Oral Health Alliance Director to develop the conjoint delivery of oral health services and teaching between the University of Queensland and Metro North Hospitals and Health Service, the local provider of public health services. This became a fascinating project as we reconfigured a new oral health service for the clinical academic environment[24].

Life in Brisbane was good, but I began to realise I missed aspects of my clinical role as a surgeon and was increasingly aware of the many, still unanswered questions within oncology research, particularly quantifying disease risk and identifying early clinical presentations within a population. Coincidentally, it was around this time that I first visited the University of Hong Kong's world-renowned Faculty of Dentistry. Unsurprisingly, having experienced first-hand the extraordinary and vibrant academic environment, I was excited to receive an offer to join the University and commenced as Clinical Professor and Head of Oral & Maxillofacial Surgery in late 2017, ultimately becoming Associate Faculty Dean and Director of the Prince Philip Dental Hospital in 2019[25].

Possessing a distinct and stable geographic population, together with high standards of modern healthcare provision, Hong Kong provided a unique environment to conduct patient cohort studies examining disease risk, socioenvironmental influence on disease progression and treatment efficacy. Cancer is the leading cause of death in Hong Kong and oral cancer, the tenth most frequent cause of cancer death in males, has shown a significant rise in incidence in recent years. We therefore initiated studies to identify the geographic sub-population most at risk of oral carcinogenesis, and retrospectively profiled clinicopathological features of disease and post-treatment outcomes in defined patient cohorts. By characterising the 'high risk' population, it became possible to commence targeted screening interventions within local districts and identify disease at the earliest possible stages[26-28].

A Return to 'Oz'

By early 2021, the disruption and confusion of the global COVID-19 pandemic was entering its second year and proving as frustratingly unpredictable as ever. Just as I was approaching the end of my fixed-term appointment in Hong Kong, an opportunity arose to return to Australia as Head of Dentistry and Professor of Oral & Maxillofacial Sciences at James Cook University (JCU) in Tropical North Queensland[29].

With a stated intent to create a brighter future for life in the Tropics through graduates and discoveries that make a difference, JCU has become a global leader in addressing the healthcare needs of rural,

remote, Indigenous and Tropical communities. The JCU Cairns campus, Dentistry's academic base, proudly bears the Indigenous name, 'Nguma-bada', which translates inspirationally as 'the place for tomorrow's learning, knowledge and wisdom'. It has proved to be a very comfortable fit indeed!

Supported by research funding from the Tropical Australian Academic Health Centre, a collaboration between JCU, local hospital and health services and the primary health network in Northern Queensland, we are embarking on our latest series of rural and regional-based population studies in oral cancer[30]. New academic staff recruitment and further development of our oncology research teams support on-going work to enhance our understanding of the natural history of oral cancer[,31]. Only in this way, can we truly make a difference and deliver real improvements in the morbidity and mortality associated with oral cancer, the most deadly of 'enemies' to confront our patients and our profession.

Forty Years…and Counting

Antonio Machado, the 19th Century Spanish poet, once wrote that there is no defined path for a traveller but rather it is the traveller who constructs their own path by walking. Whilst the original Spanish is undoubtedly more eloquent, the relevance is striking as I look back over my 40-year journey in Dentistry. I have attempted, not always successfully, to integrate scientific enquiry and translational research within contemporary practice as an oral and maxillofacial surgeon and to progress from individual patient-based intervention to address population risk. I believe we have made progress and answered initial research questions, but research is an active and on-going process. To maintain relevance, it is important that our research hypotheses are initiated, led and mentored by active clinical practitioners.

On reflection, I think Jung was correct. My 40-year career in clinical practice and research does indeed feel preparatory rather than definitive. Sadly, but nonetheless realistically despite my attempts at career longevity, much of the next 40-years in Dentistry will take place without me. It is to the future generations we must turn to advance the science and practice of our profession. I wish them well in their endeavours.

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FIGURE

Figure 1: Peter Thomson, Head of Dentistry and Professor of Oral & Maxillofacial Sciences, James Cook University, Australia.