



Hard Tissue: shaping minds for the future

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Abstract

It is envisaged that we will imagine all the developments that will occur. At no moment in our history is this so far from the truth, there is no status quo and the only real constant is change. Perhaps we will see developments beyond our imagination as something that has happened over the past century.

Every time a new scientific and medical journal is launched, we keep wishing that someday clinical sciences could become a completely mature subject without daily change. However, this has always proven to be far from the truth. Medicine is an immense discipline, and only now we are beginning to realise the depths of our ignorance.

Lately, many new techniques and technologies have been introduced

through translational research that was built on the knowledge acquired from the application in the discipline of basic sciences over the last two centuries. The new knowledge has brought many benefits, including improvement in human health. Meanwhile, it has led to controversies and ethical debates over many issues, including balancing of environmental risks with benefits, genetic testing, human reproductive cloning, and so on.

This translational change allowed the introduction of interconnected scientific and clinical principles rather than separate phenomena. The change was welcomed and has allowed the fast progression of science which has changed every aspect in our lives, as we are now living in the digital age and potentially progressing to the nano age.

Nowadays, almost all laboratory-based scientific research is being translated into a corresponding research in a clinical discipline. This has shown to improve our understanding of the physiological and pathological processes affecting or controlling the human body and later on the understanding of this highly organised structure as a whole.

Editorial

It started with a simple premise. We have so many branches of medical science, each with a legion of experts, but we posit an umbrella to all these branches and at the same time act as a haven. We hope to provide a forum where minds can meet and share their thoughts showing communality and applicability of diverse solutions to fundamentally the same problems in different specialities^{1,2}.

This brings us to an entirely different subject: how are the separate clinical and scientific sciences to be

brought together under one periodical? To help us in this great work of understanding, a new journal was thought to be launched to look at the gaps in between different scientific disciplines that share similar basic structures.

In our case, we ask the following question: how are the separate body structures and organs controlled so that no one over functions whilst the rest fail to provide their share? We hope that through our small enterprise we will mimic the necessary balance that can be achieved through a vast network of feedback controls. Hence, homeostasis can be achieved.

The study of hard tissues is therefore a joint venture and one that requires considerable effort. What is hard in studying is often enjoyable and worth excelling in. The ability to turn symptoms into the right diagnosis and into treatment plan rapidly is what eventually makes a good clinician³⁻⁶.

Trauma and orthopaedics

Without doubt, the advancement in this discipline has led to significant improvement in the quality of life of significant portion of the population³⁻⁷. Scientific and systematic approach to polytrauma patients has led to a significant decrease in morbidity and mortality in this cohort^{8,9}. The introduction of joint replacement (arthroplasty) surgery has specifically led to improved quality of life of our aged population¹⁰. Spinal disorders now can be managed appropriately with minimal morbidity¹¹. Also, bone tumours which are mostly common in the young population are managed through multi-discipline teams improving function and survival¹². Form and function have been improved and continue to improve

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with the advances of orthopaedic sciences³⁻⁷. Sport injuries are another important branch of orthopaedic surgery, which has advanced with the growing interest in fitness and sports in this age⁵.

Oral and maxillofacial surgery

Advancement in head and neck sciences has led to early detection and intervention when dealing with much pathology affecting the oral cavity, oropharynx, larynx, hypopharynx and nasopharynx¹³⁻¹⁸. Cancers affecting these areas continue to represent a challenge and continuous efforts are always in motion trying to identify more parameters that will assist in targeting these pathologies which will improve survival¹³⁻¹⁸. The rate of injuries affecting the maxillofacial region is high, and advances in these sciences have led to preservation of form and function of the injured structures¹⁹. A great success is being achieved nowadays when managing disorders involving the temporomandibular joint²⁰. Orthognathic surgery and cleft lip and palate surgery continue to evolve and better outcomes causing better quality of life²¹. Dentoalveolar surgery continues to be a major part of oral and maxillofacial surgery²².

Otolaryngology with head and neck surgery

The application of hard tissue techniques is fundamental to otolaryngological practice from skull-base²³⁻³² to middle ear surgery^{33,34}. Many advances from prosthesis development (with biointegration) to tissue engineering have seen significant leaps in patient treatments and outcomes. We will endeavour to promote and display good practice, recent advances and share significant advances in practice with 'tips and tricks'³⁵⁻³⁹. Implantation of advanced electronic devices (with their potential of remote programming) range from cochlear implants to brainstem and cortical implants which are beginning

to open up the world of sound to those without noise. Furthermore, cochlear implants have led to a revolution in ear sciences and enormous help for the people in need for such technology^{33,34}.

The advances in the field of head and neck surgery and oncology have led to improved outcomes^{15-18,35,40-42}. This is associated with all the advances achieved in the fields of airway management, tumour assessment and control^{43,44}.

Dental surgery

One of the most important disciplines in hard tissue sciences is dental surgery. Dentists deal with several pathologies affecting the dental and periodontal structures. Studies have shown that prevention of dental decay and periodontal diseases reduces mortality⁴⁵. The advances in dental implant surgery have led to improvement in quality of life worldwide⁴⁶. Furthermore, the introduction of laser technology in dentistry has improved outcome and reduced the patient's negative experience^{47,48}. Dental practitioners continue to be more sensitive in identifying and referring patients with potential oral cancer^{49,50}.

Family medicine

Almost counter intuitively, this is a 'final frontier' where a translational procedure is sufficiently advanced, it should be applicable by any practitioner and the greatest arena of application is in the field of family medicine. The ethical decision-making in this forum is at its most challenging. Disease modification before any pathological insult has resulted in entrenched changes in an area where an ounce of prevention or modification is worth a pound of attempted cure. This is where the most good can be delivered to the most people. Too often a situation where a treatment is only available in a super specialist centre and only works in 'certain' hands is lauded as a major advance; however, the application of

the scientific principle suggests that we must aim for reproducible technologies given the same materials and methodology despite different the experimenters. Not only the technology, technique and application but also the decision to treat is fundamental to successful outcomes. As one progresses in the art the hardest thing one learns is not when to treat, but when not to treat⁵¹.

The introduction of new technologies and advances in scientific research

Several new technologies have been introduced which led to advances in the field of tissue engineering and molecular biology, biophysics, stem cells, mechanics and regeneration and nanotechnology^{1-7,40-42}. The introduction of optical technology (including lasers, optical diagnostics and photodynamic therapy) has led to major advances in this area of sciences including early diagnosis and management of tumours and management of wound infections and tissue healing^{15,17,39-42}.

Sciences assessing musculoskeletal disorders, aging and osteoporosis are of the utmost importance and can prevent disability in susceptible population. Also, the use of imaging and histopathology in assessing disorders and pathological processes and the subsequent advances in these fields gave us a great understanding of these problems and how to manage them¹⁻⁷.

Training

Hard Tissue will be also oriented towards the educational needs of post-graduates of dentistry, medicine and surgery and of related healthcare sciences by presenting the disorder in the context of the current knowledge of human pathophysiology and of clinical practice^{29,36,37,52,53}.

Ethical considerations

Often ethics are given 'lip service' by journals; however, we want to reverse

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this trend because to the editorial team, 'the ends do not justify the means'. Open and honest transparency is essential to trust and decision-making. We would recommend all contributors to follow the principles set out in the Association for Medical Ethics rules of disclosure. Of those rules is one that we will adhere to which requires all contributors to fully disclose their financial conflicts of interest in precise amounts to be included in the text. This makes us the only journal to practice full financial disclosure and is setting the bar high for other journals as never before. No one condemns taking money from industry—even a lot of money—just disclose it fully and precisely⁵⁴.

The ability to assess development depends upon fully being aware of the possibility only of confounding factors and bias. At the very least, financial issues in recent studies that contribute to this should be made aware of to the reader. Thus, Hard Tissue readers can be assured that they will be fully informed—unlike all other journals—of all the circumstances behind its publications.

It is our aim with this journal to encourage the interface between all clinicians and scientists involved in management of hard tissue injuries or diseases with a truly multidisciplinary approach, when indicated.

There are many challenges that are ahead of us, among which are to ensure high quality articles and original studies in a competitive field, keeping pace with new developments, discoveries and providing a timely and fair review process.

Finally, we wish to extend our deepest appreciation to many others who have helped shaping our minds and ideas over the years. We present to you 'Hard Tissue' an Open Access Peer Reviewed Journal, a forum to shape our minds and the minds of anyone interested in the discipline of hard tissue sciences.

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