**Book Reviews**


That the intricate, ordered and cellularly complex biological machine that is muscle can be damaged by excessive or inappropriate use is not in itself surprising. Force can damage a muscle as it can damage a beautifully crafted clock or ever miraculous computer. The paradox is that muscle not only is anatomy’s principal means of generating force but in everyday life it is also the most important means of absorbing force. Unlike the damaged clock or computer, muscle possesses the remarkable capability of regenerating and restoring the intricate mechanism. Beyond this, and the principal achievement of this book, is the insight that muscle damage and its correlates of structure, chemistry and function provides to the understanding of muscle physiology in health and disease.

In his preface, Stanley Salmons explains how he satisfactorily dealt with securing the issue of peer review in the issue of the journal *Basic and Applied Myology* which he had been invited to edit in 1992, given that the most prominent researchers in the field were invited contributors. These same authors were subsequently invited to contribute to this book to which other invited authors added chapters. A somewhat similar caveat is perhaps needed from me because I have collaborated in muscle research with (or know personally) the senior contributors of 8 of the 11 chapters and observed with interest (from a greater distance) the previous publications of the remainder. This said, I have moved on to other challenges and have had no communication on muscle damage with any of the contributors for nearly 2 years. I trust therefore that any comments on the book can be accepted as objective from someone sufficiently close to be well informed but where new geography and the passage of time serve to protect against bias.

Themes addressed in several of the chapters deal with the damage induced in human muscle by exercise, especially eccentric exercise in which muscles are lengthened while holding force. Following exercise, evidence of damage in the form of soreness or pain is often delayed (hence Delayed Onset Muscle Soreness—DOMS), but its time course does not closely mirror the cellular damage as indicated by release of soluble cytoplasmic constituents especially creatine kinase and myoglobin. Different again is the time course of the muscle dysfunction (e.g. fatigue) which has a slow recovery. To this must be added the indicators of cellular damage (prostaglandins and other free radical-mediated or related compounds) which may have significance to the physiology of pain mediation or the processes involved in repair.

From the biochemical approach in experimental model systems comes better understanding of intracellular mechanisms involved and interesting attempts to protect against muscle damage pharmacologically, e.g. by seeking to prevent the damaging accumulation of intracellular calcium ions by pretreatment with dantrolene sodium or preventing free radical-mediated damage by pretreatment with an antioxidant. From the observation of lower CK release after comparable exercise in women than men the protective effects of oestradiol and converse effects of tamoxifen are providing insights into hormonal influences on membrane integrity under mechanical stress. Drug-induced muscle damage and the effects of ischaemia and reperfusion serve as further parallels sharing some common mechanisms to those associated with muscle damage.

Mechanical damage has been explored using isolated muscle systems. This has revealed the importance of redistribution of sarcomere length as a consequence of eccentric as a fundamental consequence of over-stretching the mechanically weaker sarcomeres and allowing the stronger sarcomeres in series to become over-contracted. This process has led to the ideas of ‘popping’ of sarcomeres, the extraction of thick (myosin) filaments from their normal relationship with the thin (actin) filaments and Z-disk architecture. The susceptibility to such damage appears to depend on whether the muscles are of the slow or fast-twitch type.

Molecular markers are now used to map progress of muscle damage, regeneration, repair and the study of the plasticity of fibre type characteristics in response to cross-innervation (transplantation) or chronic electrical stimulation. To these indicators of damage or strain injury are added imaging by magnetic resonance or use of technetium pyrophosphate.

It may be asked why do all this work if the only problem is some muscle stiffness at the beginning of the football season! Apart from scientific curiosity as to how muscles work and repair themselves, an important reason is to learn about cellular damage in diseases of muscle (the myopathies). Finally and not least (given the focus of the editor’s interest) comes the still not entirely resolved problem of enabling skeletal muscle to go on working consistently and reliably enough to provide support for the failing human heart with a suitably constructed surgical autograft preparation. In this lies the hope for a possible alternative to heart transplantation but there is still more research to be done before this becomes a routine, effective and cost-effective treatment.

This book is an authoritative, concise account of an exciting saga. While much has been learned there are still many questions to answer with further research. It will make fascinating reading for sports scientists, pathologists and muscle physiologists and biochemists.

**Richard H. T. Edwards**


This is part of a growing series of interactive CDs covering different areas of the body, from the standpoint of sectional anatomy. Each particular area is presented as a complete series of 2.25 mm sections taken in each of the 3 primary sets of planes. The system is based on 1 series taken through a tissue block derived from a cadaver. A video image was made of each section. The images were digitised, virtually reconstructed in 3D and then serially resectioned electronically in each of the other 2 primary planes. This resulted in 3 complete, mutually perpendicular series of images through the specimen.
The images within each series can be studied in several ways. For example, they can be examined in sequence by driving through the series from beginning to end. This can be done at 3 speeds: frame by frame, and by taking either a slow or a fast tour through the series, while being able to stop at any level along it. Taking the fast tour gives a genuine impression of travelling through the specimen. Another option is to select any frame within the series using clearly designed key reference diagrams. This allows immediate viewing of a particular plane of section. It is also possible to call up sections showing any particular structure by clicking on its name in a comprehensive index in Latin or English. Access is thus rapid, user-friendly and helpfully designed.

Once a particular plane has been selected, the same area can be viewed in 4 ways, showing its anatomy, its histology, its MR or its CT scan image. The CT scans were made from the specimen sectioned. The MR images were obtained from a volunteer. Each image can be looked at separately, or all 4 can be viewed together. Zoom facilities are available for the anatomy and histology modes.

The basic approach adopted is to present an unlabelled section on the screen. The anatomy series consists of images of the actual individual sections in natural colour. The colour range is limited, being that of embalmed material. Nevertheless, the various structures are well differentiated by differing colours, tints and tones. There is no evident loss of detail between the primary series of images and those which have been reconstructed. While structures are not labelled, all of those of significance can be immediately identified by clicking over the particular profile, whereupon its name appears in a label on the screen.

The primary value of the system will be for postgraduate and professional training and reference, for which it constitutes an indispensable resource. The thinness of the anatomical sections means that they can match the ever-increasing resolution of scanned images as the relevant technology advances. By its nature, any series of sections of this kind includes only a limited number of levels which show most features in a familiar way. The correlation between the CT scans and the anatomy images is very close. The correspondence between the MR image and the anatomical section is not always exact, but it is sufficiently good to enable easy cross reference between the two. The inclusion of all sections, and the possibility of rapid transit through the series, places these literally in context. For those wanting to interpret sectional scanning images necessarily lying at atypical or unfamiliar levels, this system will be of great value. For undergraduate training its main appeal lies in its anatomy and histology modes.

Installation is simple, quick and easy to perform. Clear instructions are given on the use of the system. Much effort has been applied to making both access and display rapid and user-friendly. The addition of a zoom facility and improved screen layout are new features compared with previous discs in the series.

Each part of the series is provided in CDI-I and CD-Rom formats. One set covers the hand and wrist. The other covers the shoulder joint and axilla. There were no evident faults in the former. Strangely, in the latter the master inset image, which is intended to continually indicate the position and orientation within the series of the section under study, was that of the wrist and hand rather than that of the shoulder region. Four different levels of zoom are possible, but only the lowest is really of value, since the pixels obstruct at the higher levels, so that no significant gain in detail ensues.

In summary, this system will be of enormous benefit for learning, cross-referencing and revising cross-sectional images. The greater the cross-referencing detail required the greater will be its relevance and value, which means that it will be mainly of use at postgraduate and specialist levels.

JOHN FRAHER


The anaesthetist requires a peculiarly specialised knowledge of topographical anatomy. Some regions of the body (for example the respiratory passages, the major veins and the peripheral nerves) the anaesthetist must know in intimate detail and with an understanding of anatomical anomalies that rival that of the surgeon; other areas may be almost ignored. The importance of the subject for the safe practice of anaesthesia is well recognised—not least by examiners for higher qualifications in the subject.

The role of anatomy in anaesthetic teaching and practice today goes far beyond being a prerequisite for the safe practice of local anaesthetic blocks. It is also important in the understanding of the airway, the function of the lungs, the circulation, venous access, pain control, the monitoring of neuromuscular blocks and many other aspects of practical anaesthesia.

This new book has as its authors Dr Sue Black, an anatomist at the University of Glasgow, and Dr W. A. Chambers, consultant in anaesthesia and pain relief in Aberdeen. They have combined to produce a clearly written text, elegantly illustrated by clear line diagrams and x-rays. The wide field of anatomy relevant to the anaesthetist is covered and the book can be recommended to the anaesthetic trainee as well as to the teacher.

HAROLD ELLIS


The left-hand page displays the questions, the facing page displays the answers and explanations. The book is arranged on a regional basis, with final sections devoted to histology, neuroanatomy and embryology.

I find this book intensely depressing. A Chinese proverb states that if one views a leopard through a sufficiently small-bore tube, all one sees is a spot. It has also been said that if one views a student through an MCQ, all one sees is a fact. How strongly does this apply to many of the questions asked in this book?

A great deal of the anatomy learned as a result of working through this book is trivial and some of it is nonsense. Is it really worth our students being given the mnemonic that reminds them of the sequence of insertion of the sartorius, gracilis and semitendinously on the medial aspect of the upper tibia?

Am I dim, or senile, when I look at the answer to the
question on the aditus to the lesser sac? The question is, ‘The lesser sac has an aditus which has free communication with the hepatorenal pouch’. Answer: ‘False. This is rubbish! The aditus is in free communication with the greater sac, a small part of which is the hepatorenal pouch, though this latter structure (sic) is some distance from the lesser sac, being the right posterior subphrenic space.’ Get it? I don’t.

Real knowledge of functional anatomy cannot be learned, revised or tested by MCQ. Unfortunately such books, together with ‘spot’ tests, in which students need to give names to structures flagged using Blue Tack, set an unofficial curriculum for students preparing for examination.

R. M. KIRK

Photographic Atlas of Practical Anatomy, part 1:

This atlas presents the most beautiful and vivid colour photographs of dissections that this reviewer has ever seen. It represents the first of what will be two, two-volume sets and deals with the abdomen and the lower limbs. The first volume of this pair comprises unlabelled colour photographs on the right hand page with detailed explanatory notes on the left. The companion volume has the same photographs, this time in black and white, which are marked with arrowheads. Numbers in the margins line up with these symbols and are keyed to the list of anatomical terms on the facing page. By using both the volumes, the reader can locate the names and positions of structures without having the large colour photographs obscured in any way.

The author, who is Professor at the Anatomical Institute of the University of Graz, Austria, carried out the great majority of the dissections and also took the photographs. The quality of the preservative technique which was used has resulted in an almost lifelike appearance of the material, so that it resembles closely that of the tissues and organs encountered at surgical exposure.

This is undoubtedly an exciting study in anatomical photographic illustration. Structures not usually easy to demonstrate, such as fascial layers, are visualised more clearly than I have seen in other photographic atlases and have a more realistic appearance than can be achieved in diagram form. It is a work that will be of value to anatomists and surgeons and is both useful and aesthetically pleasing.

HAROLD ELLIS