Book Review:
Radiology of Australian Mammals

Reviewed by
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Have you ever been faced with an injured possum, lame wombat or wallaby with a wobbly tail and wanted to take a radiograph to help you decide what was going on? Only then to be faced with a grim situation: on the radiograph you can see bones and they are leg-bones, but they don’t really bear any resemblance to a dog or cat. What are they? Should they look like that? Tarsal bones designed for hopping are not likely to look like those designed for walking. Is that normal?

Take it back a step: perhaps you would like to radiograph an Australian mammal, but are not sure how to approach this task. Can you (or should you) even sedate native mammals? What's the correct sedative dose for an echidna, platypus or bat? What is the dental formula for a wallaby, and what does lumpy jaw look like?

Radiographic anatomy of individual species has been published piecemeal over the last hundred years or so, but it is difficult to find it all in one place. The species of wallaby or possum in your practice might be different to pictures on the internet, and North American mammals are just not the same even if we squint...

Radiology of Australian Mammals provides the first detailed reference for normal anatomy of Australian mammals and thankfully it is an outstanding resource in a concise format. The text focusses on the more common species of echidna, platypus, macropods (kangaroos and wallabies), koala, wombats, dasyurids (carnivorous marsupials like quolls and Tasmanian devils), possums and gliders, bandicoots and the bilby, and bats. Studies were obtained on animals primarily presented to Taronga Zoo in Sydney and all animals were anaesthetised for examination. Authors Larry Vogelnest and Graeme Allan are eminently qualified to present such a text; Vogelnest is the senior zoo veterinarian at Taronga Zoo with over 25 years’ experience, and Allan remains Australia’s most experienced small animal radiologist with over 40 years’ experience. Other authors make small but important contributions, including veterinarians Susan Hemsley (koalas), Nadine Fiani (dental radiology), Frances Hulst (pathology case studies) and taxonomic advisor and curator Paul Andrew (Appendix 1).

Most of the book documents the normal radiographic anatomy of the aforementioned species. The first chapter, Radiographic Technique, reinforces standard radiographic principles including obtaining orthogonal views, appropriate labelling and obtaining comparison views. Tables featuring suggestions for sedative doses for the different species are an excellent inclusion.

The text follows a logical format easily accessible for the casual user who needs to brush up on radiographic anatomy for a single species. I was expecting each of the nine chapters on different species to be dry and uninteresting to read in a cover-to-cover format; how wrong I was! Did you know that echidnas share skeletal similarities to crocodilians, and their keratinised spines (quills) make the most fantastic shadows across their image (Figure 1)? Or that ghost bats have a simple carpus with fused bones that are capable of extreme hyperextension during flight or hyperflexion during wing ‘storage’ (Figure 2)? Or that kangaroo mandibular condyles are convex, allowing free rotation of the mandible in every direction (Figure 3)?

Chapters on echidnas and platypuses (monotremes – Figure 4) are fascinating as these species have highly unusual radiographic anatomy. The monotremes’ unique pectoral
girdle results in the formation of a box-like bony structure which is firmly connected to the body, not dissimilar to typical mammalian pelvis. The result is vastly different to other mammals with the pectoral girdle firmly anchoring the thoracic limbs of these ‘digging machines’ to the spine. To the eye of a practitioner familiar with companion mammals (dogs, cats, horses) these creatures have a bizarre anatomy and had I been faced with a platypus radiograph to interpret without this book, it may have been hard to work out up from down.

The bulk of each chapter focusses on demonstrating normal skeletal anatomy of each species; sections on the appendicular and axial skeleton identify all of the bones in the body regardless of the size of the animal. Important distinctions between species are included when relevant. Less detail is presented of the radiographic anatomy of the soft tissues like thorax and abdomen, although references to genital anatomy are included. Details about pouch anatomy will help in marsupial radiographs. The chapter on dental radiography provides the dental formulae for the major species with high quality dental radiographic images.

The final chapter presenting pathological case studies is terrific in a text of normative anatomy, with cases included from practitioners around the country to create a ‘sampler’ or ‘vignette’ of disease without trying to be all encompassing. Fractures feature heavily with examples of typical fractures (for example, fracture of cervical vertebra 2 is common in macropods after collision with fences), each with an explanation for why the pathology may be relevant (fractures of the echidna beak, although subtle, can affecting breathing and eating). References to metabolic disease are included (important in any captive population) as well as examples of osteoarthritis and osteomyelitis in several species. Cryptococcosis is more common in koalas than in domestic mammals, presenting as aggressive bone lesions with several excellent examples pictured. Necrobacillosis (lumpy jaw) of macropods, dental malocclusion in wombats, aspiration pneumonia, and several examples of gastrointestinal ileus are presented across many species. The final appendix provides a taxonomic checklist of Australian mammals using both common and scientific names.

This publication is outstanding for its high-quality images and concise text. Given many of the species included are small (sometimes weighing much less than 1 kg), every image is beautiful. Images typically are large with simple labels and perfectly positioned arrows demonstrating bony and other anatomy. This book is an essential reference for anyone (practitioner, radiologist, nurse, and student) who might deal with Australian mammals. If you don’t think you are likely to radiograph a wombat or possum soon, buy a copy anyway and leave it on your coffee table next time you have guests. It is fun to read (yes, I am a radiology-nerd), it will be a great conversation-starter and you will look like a most sophisticated practitioner!