

An Atlas of Surgical Anatomy

A detailed pencil drawing of a surgical procedure on a hand. The hand is held in a specific position, and a surgical instrument, possibly a scalpel or forceps, is being used to make an incision or manipulate tissue. The drawing shows the underlying anatomy, including muscles, tendons, and nerves, with fine lines and shading to indicate depth and texture.

*Surgical Commentary
by Alain C Masquelet*

Illustrations by Léon Dorn

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An Atlas of Surgical Anatomy

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Surgical Anatomy

Surgical commentary by

Alain C Masquelet, MD

Illustrations by Léon Dorn

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Preface

Léon Dorn is one of the most famous medical illustrators in the world. Even today, at 80 years of age, he continues to pursue his work with the same enthusiasm. His work coincides with his great passion: the representation of the human body. Anatomy holds no secrets for him. He has spent countless hours in operating theatres, dissecting rooms and with himself; when Léon Dorn is drawing hands, he is drawing his own hands ...

Until recently, medical illustration was an undervalued job. The illustrators were basically artists, attracted to the human body. Many of them were self-trained people. Most of the time they were not well considered and some publishers even refused to mention their names in books.

Today, medical illustration has gained its 'letters patent of nobility'. Léon Dorn has witnessed the emergence, the development and the now well recognised state of the medical illustration.

Dorn is specially involved in the illustration of surgical techniques, which is probably the most difficult part of the art of medical illustration since the illustrator must attend surgical operations to understand what exactly is being done and then distil a long procedure into a few drawings. Usually, no more than five to seven drawings are needed to illustrate a surgical technique. The skill and possibly the genius of the artist lies in their ability to condense multiple operating stages into a limited number of drawings.

From a didactic point of view, it reveals the superiority of drawings over film. A film (movie or video sequence) delivers a linear succession of snap shots whereas a single drawing illustrates an entire sequence of a technical procedure.

For learning a technique, human understanding proceeds more by intuitive discerning of whole stages rather than separate elementary actions. This is the reason why the medical illustration based on drawings is superior to one based on videos. In spite of the recent advances in techniques of communi-

cation, the illustrated book will always be valid for the learning process.

I would like just to comment upon Léon Dorn's manner of working. Some illustrators work at home, trying to restore a surgical technique from a draft prepared by the surgeon. Dorn's method is quite different. For him, the illustrator is like a reporter, an eye witness and a field worker; he has to perceive the intensity of an acute stage to express it through the drawing. This book is an attempt to communicate this particular state of mind. With Léon Dorn we have selected over 300 drawings from among a collection of several thousands.

These selected drawings do not constitute a treatise of surgical techniques. Their function is to highlight one of the main stages of the illustrator's work, which is the 'almost finished rough sketch'. For that reason the drawings are still outlines in lead pencil, in black and white. We have included a few definitive drawings in colour to show the contrast between what is actually published and what is the most important stage of the artist's work. Thus we present isolated drawings or several associated drawings, taken from different surgical fields, which do not constitute the complete description of a surgical technique.

The drawings are succinctly explained, just for understanding what they show. Where they are present, we have kept the legends written by the artist as an aid for the definitive drawing. On the other hand, we have not added new legends that could impede the serene contemplation of the drawings. What is important for the readers is to open their eyes for pleasure; the secret is not in the text but in the illustrations. Léon Dorn has rejuvenated the tradition of the medical illustrators who were initially artists admiring the human body, such as Calcar, the pupil of Le Titian, who immortalised the dissections of Vesalius, or Jacob, the pupil of David, who drew the anatomical preparations of Bourguery.

AC Masquelet

Léon Dorn

A biographical note

Léon Dorn was born in Paris in 1920. He lived in Israel from 1932 to 1965, where he worked in a kibbutz. This long stay in Israel was interrupted for two years (1953–1954) during which he studied at the Academy of Arts in Florence (Italy). In 1961, he was named general secretary of the Organisation of Painters and Sculptors of Kibboutzim.

He began to work as a medical illustrator when he came back to France in 1965. He was mostly commissioned by Masson Publishers and, in 1989, was invited by Professor Tubiana to illustrate surgi-

cal books for Martin Dunitz. His illustrations for *An Atlas of Flaps in Limb Reconstruction* (published by Martin Dunitz) won the Royal Society of Medicine Atlas award in 1995.

Léon Dorn is a pioneer of modern medical illustration in France. He actively participated in the efforts of the European Association of Medical and Scientific Illustrators to promote special schools devoted to medical illustration. A department was opened at the Ecole Estienne of Paris in 1992.

Léon Dorn

Notes on method

What is the method of Léon Dorn? Another form of this fascinating question could be: How is the genesis of a definitive drawing?

The secret of Léon Dorn is based on two principles:

1. An excellent knowledge of anatomy. As Léon Dorn has worked with many surgeons from different specialties, he has indepth knowledge of the anatomy of the human body. Moreover, he has contributed to several books on anatomy. It can be said that during his entire professional life Dorn has continued to compare anatomy as described and taught in books with real-life anatomy as encountered in operating rooms and theatres.
2. The second principle issues from the first. Léon Dorn draws 'live'. In his professional life he is permanently on the move to attend surgical operations and dissections. The vast majority of his illustrations have not been drawn from photographs or rough sketches made by surgeons but from what he has seen and observed.

The realisation of a definitive drawing as it will be published in a book has three important stages. It has been difficult to retrieve all the stages for one drawing from Dorn's archives. He has lost many drawings, and the first stage of a drawing is generally destroyed.

We have only one example of a complete series.

- a) The first drawing is done in the operating room or in a theatre of anatomy. It can be called a sketch, but it is a very precise sketch. All the proportions are good, and all the structures are set in place: the nerves are coloured yellow, veins blue and arteries red. Some legends are added to remember exactly what has been drawn.
- b) The second stage is drawn 'at home'. It is the intermediate stage between the sketch and the definitive drawing. It can be called the 'rough drawing'. Details are precisely drawn, for example the representation of the arteries and the thickness of the subcutaneous tissue. In this stage, primarily the shadows are applied to increase the impression of volume for the muscles and the perspective for the deep structures. The rough drawing is given to the surgeon who can then modify any detail on a tracing paper firmly attached to the drawing.
- c) The definitive drawing is made once the rough drawing has been corrected. The structures are coloured or underlined in black ink and with paint.

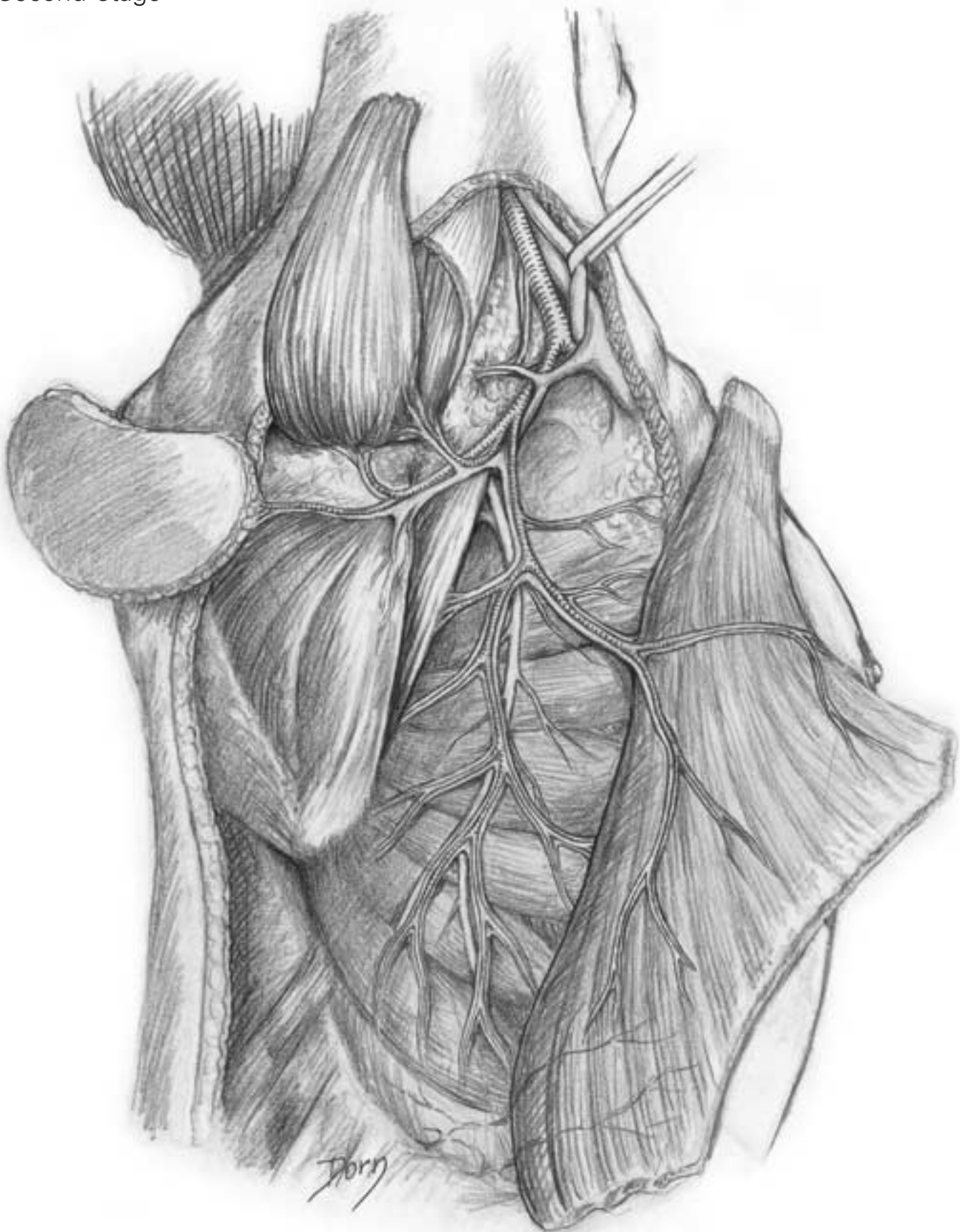
The destiny of each stage is quite different:

- The sketches are generally destroyed or lost.
- The definitive drawing is given to the publisher and becomes their property.
- The intermediate stage - the rough drawing - which is, in fact, the most beautiful stage because it is the most realistic, remains the property of Léon Dorn.

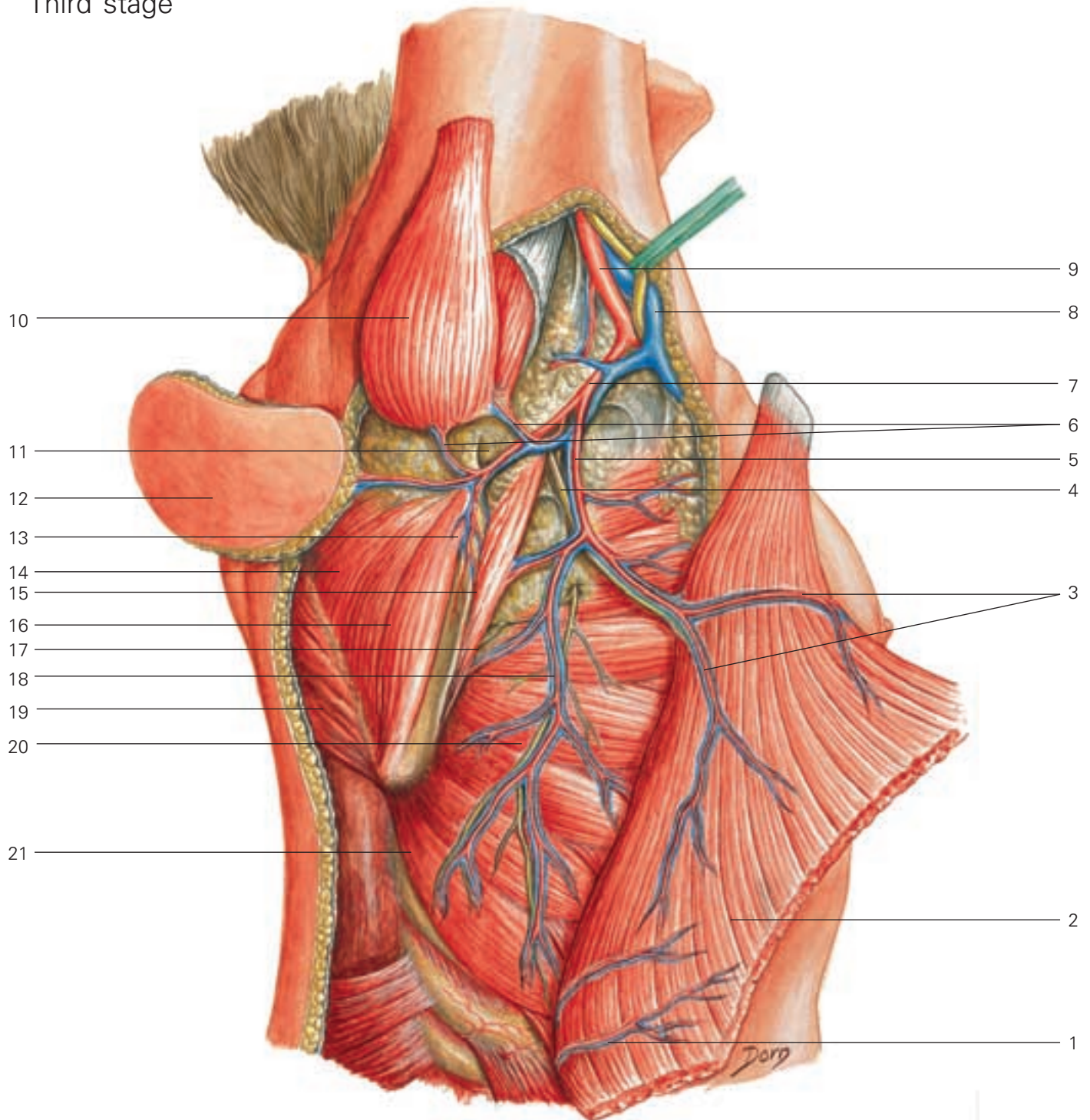
First stage



Second stage



Third stage



D

- | | | |
|--|--|--|
| 1 intramuscular pedicle issuing from intercostal arteries | 7 subscapular artery | 15 subscapular muscle |
| 2 latissimus dorsi muscle | 8 axillary vein | 16 teres minor muscle |
| 3 intramuscular divisions of vascular pedicle supplying latissimus dorsi | 9 axillary artery | 17 bony angular branch to scapula (anastomoses with vascular pedicle supplying rim of scapula) |
| 4 nerve to latissimus dorsi | 10 teres major muscle | 18 thoracic vessels |
| 5 thoracodorsal pedicle | 11 circumflex scapular artery and vein | 19 trapezius and rhomboid muscles |
| 6 pedicles to teres major muscle | 12 scapular flap | 20 long thoracic nerve |
| | 13 vascular pedicle supplying rim of the scapula | 21 serratus anterior muscle |
| | 14 infraspinatus muscle | |

Reconstructive surgery

During the past 30 years, reconstructive surgery has undergone incredible development. One of the main factors is microsurgical techniques which have permitted transfer of all kinds of tissue. There has been a renewed interest in anatomy, especially for the description of nutritive sources and vascular pedicles.

Recent advances in immunosuppressive treatment have allowed allotransplantation of functional organs, such as the hand.

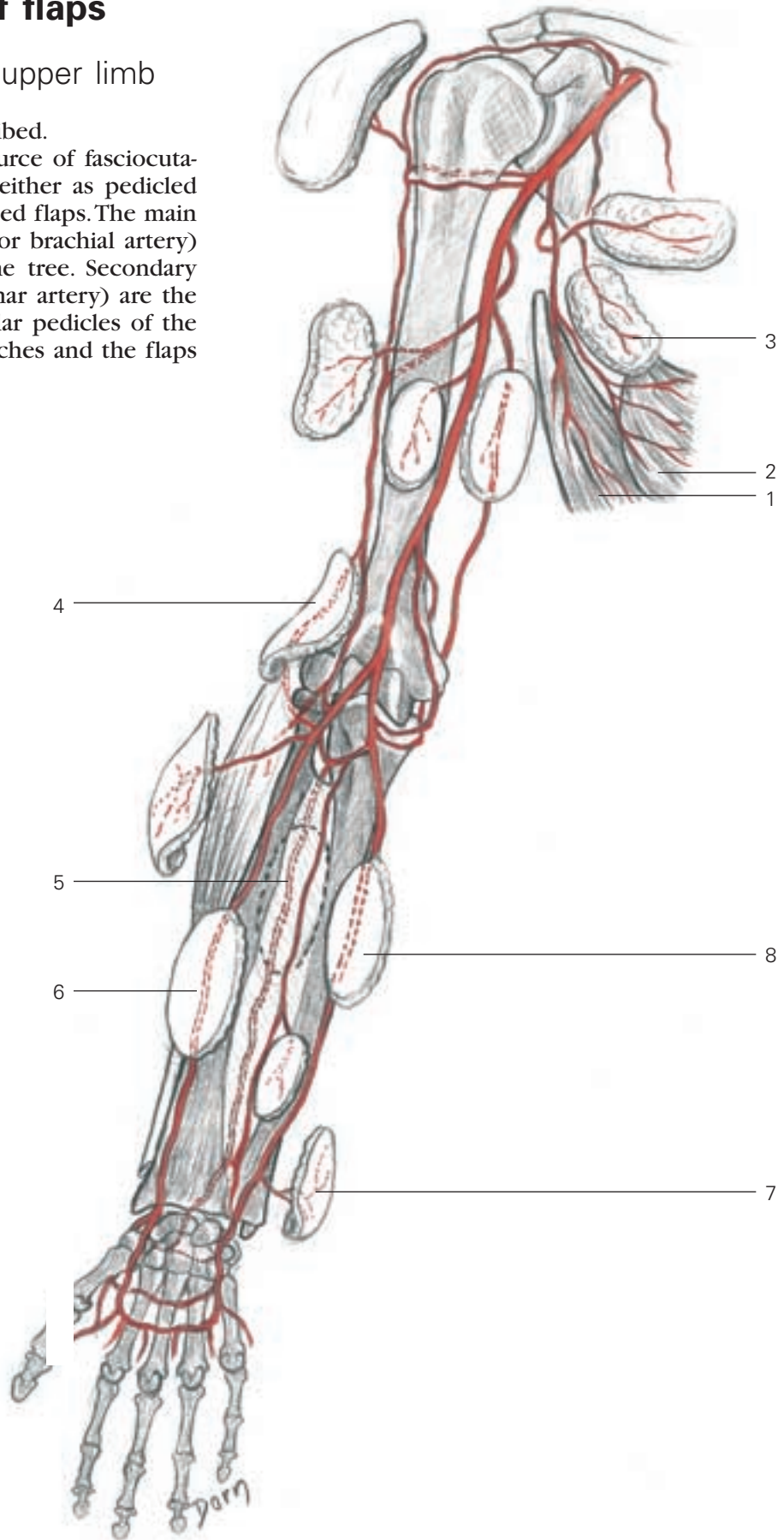
An Atlas of Flaps of the Musculoskeletal System is the latest book illustrated by Léon Dorn. All the drawings are based on anatomical dissections and every detail is authentic.

Anatomy: the tree of flaps

The tree of flaps for the upper limb

Numerous flaps have been described.

The upper extremity is the source of fasciocutaneous flaps which can be used either as pedicled island flaps or as free revascularised flaps. The main vascular axis (the axillary artery or brachial artery) is considered as the trunk of the tree. Secondary arteries (such as the radial or ulnar artery) are the divisions of the trunk. The vascular pedicles of the flaps are formed from small branches and the flaps are the leaves.



- 1 latissimus dorsi flap
- 2 serratus anterior flap
- 3 scapular flaps
- 4 lateral arm flap
- 5 posterior intraosseous flap
- 6 radial forearm flap
- 7 distal ulnar flap
- 8 ulnar forearm flap