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# Preface

Segmental renal diseases or pathologies are those occurring in a segment of an organ. A segment of the kidney, like those in the lung or liver, is not just any portion of the organ but a precise embryological and anatomically autonomous structural district with an equally autonomous function. Some diseases affect the kidney, temporarily, in a segment, respecting the rest of the organ; at this stage the pathology is segmental and if its treatment is surgical, the operation consists of a segmentectomy—that is, precise excision of the segment—leaving the rest of the kidney unscathed.

Study of the development of the kidney (embryology, organogenesis, and final constitution) has made it possible to establish a way to locate, reach, and remove each renal segment, i.e., renal lobe.

Segmental renal diseases and pathologies are not frequent, in fact they are rather rarer than those that are diffuse in the parenchyma or located in peripheral or nonsegmental areas of the kidney. Consequently, kidney segmentectomies (lobectomies) are indicated less frequently than other types of conservative surgery.

From a surgical point of view there is an essential difference in the aggressiveness of the technique in the kidney: endorenal in segmentectomies and extrarenal in tumorectomies, partial nephrectomies, and renal resections. Renal segmentectomies require a hilum–sinus approach; they are a typical kind of endorenal surgery.

The content of this book focuses on the peculiar characteristics of segmental renal diseases and pathologies, and anatomico-surgical aspects of endorenal surgery for specific segment removal in the kidney.

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# Introduction

Some organs, such as the lungs, the kidneys, and the liver, are made up of lobes, which in the lungs and liver are clearly visible, but much less evident in the kidneys. The lungs and liver appear to have a lobated structure from the outside and shelter the internal functioning parenchymal segments. This function is inherent to all organ systems and can work independently due to the fact that it remains operative even when other parts of the lobe or the organ have been removed or are nonfunctioning as a result of illness. The segments have their own vessels, nerves, and aeration and secretion ducts, and as a result it is possible, when necessary, to remove the segment without causing any damage to the rest of the lobe (lung, liver). This leaves the organ sound and only deprived of the removed area.

In childhood, the kidney has an external lobated appearance, whereas in adulthood it is commonly compact or conglomerate. In any case, the interior of its structure is composed of lobes, each made up of a minor calyx that receives the apex papillae of the pyramid surrounded by its own cortical envelop, which together form the renal segment. It is also possible to perform a lobectomy on the kidney, which is known as a renal segment ablation.

Some pathologies and diseases are temporary in that they represent just a stage in the process of an illness, others are definitive, referring to malformations or an irreversible pathologic situation with district localization, and are segmentary. In these cases, if surgical therapy is deemed to be necessary, segmentectomies or segmental resections are possible. In the kidney they are also called lobectomies or calicectomies.

These situations are perhaps rare but it is important to remember that rare does not mean nonexistent!

When and why those diseases or pathologies can be considered segmentary and thus necessitate renal segmentectomy and intrarenal plastic surgery is the topic of this book.

Readers will notice that the bibliography following some chapters occasionally appears old, as in the case of, for example, phylogenesis and the anatomic surgery of intrarenal operations and typical lobectomy techniques. For the section on phylogenesis I decided to report the source from which all the successive literature came, judging it inappropriate to ignore it. For the intrarenal surgery and lobectomy procedures I described in 1997, there are no significant notes or findings other than those published at that time by the Intrarenal Surgery Society, which are frequently cited in the book.

To better understand the topic, the book is divided into:

Part I: Pathologies and Diseases Representing Indications  
for Segmentectomy

Part II: Surgical Management

**Part I**  
**Pathologies and Diseases**  
**Representing Indications for**  
**Segmentectomy**

# Chapter 1

## General Remarks

This part of Urology covers two inter-linked issues: Firstly, the study of pathologies and diseases that are located or potentially located in a single part of the organ, thus leaving the rest of it healthy and disease free; secondly, the study of surgical peculiarities in the targeted removal of part of the organ leaving the rest intact and functioning, known as segmentectomy. The value of the relationship between these two groups of study is clear if one wants to consider the pathological, clinical, and therapeutic aspects of each field.

This pathology will explain why pathologic phenomena or processes occur, and in some cases only temporarily, and remain in the specific part of the organ in which they started.

Clinical results will demonstrate if and when it is necessary to treat the disease or pathological processes in order to alleviate the issues or prevent them from getting worse. Therapeutic indications, in our case surgical, are part of the clinical discipline.

The surgical, segmentary treatment of the kidney consists of removing one or more renal lobes according to the manifestation and extent of the disease. Since the surgical technique begins by identifying the calyx in which the pathologic lobe opens, the lobectomy technique used is also called a calicectomy.

It is well known that it is possible to remove the affected part of the kidney through surgical procedures other than those specified above. This occurs in the case of small or