UROLOGY

EDITED BY

JOHN BLANDY

VOLUME II

BLACK

UROLOGY

EDITED BY

JOHN BLANDY

MA, DM, MCh, FRCS
Professor of Urology
The University of London
and The London Hospital
Medical College
Consultant Urological Surgeon
to St Peter's Hospital

IN TWO VOLUMES

VOLUME II

BLACKWELL SCIENTIFIC PUBLICATIONS

OXFORD LONDON EDINBURGH MELBOURNE

Osney Mead, Oxford,
8 John Street, London WC1
9 Forrest Road, Edinburgh,
P.O. Box 9, North Balwyn, Victoria, Australia.

ISBN Volume I 0 632 09960 7
ISBN Volume II 0 632 00019 8
ISBN Complete Set 0 632 00029 5

First published 1976

Distributed in the U.S.A. by
J.B. Lippincott Company, Philadelphia
and in Canada by
J.B. Lippincott Company of
Canada Ltd., Toronto

Printed and bound in Great Britain by
William Clowes & Sons, Limited,
London, Beccles and Colchester

UROLOGY

LIST OF CONTRIBUTORS

C. K. Anderson MB, ChB, MRCPath, *Senior Lecturer, Department of Pathology, University of Leeds*

A. W. Asscher BSc, MD, FRCP, *Reader in Medicine, Welsh National School of Medicine*

John P. Blandy MA, DM, MCh, FRCS, *Professor of Urology at the London Hospital Medical College in the University of London; Consultant Surgeon, St Peter's Hospitals, London*

R. Y. Calne MA, MS, FRCS, FRS, *Professor of Surgery, University of Cambridge*

P. B. Clark MA, MD, MChir, FRCS, *Consultant Urological Surgeon, General Infirmary, St James's Hospital and Seacroft Hospital, Leeds*

E. R. Davies MA, FRCPE, FRCR, *Radiologist, Bristol Royal Infirmary; Clinical Lecturer, University of Bristol*

L. Edwards MA, MChir, FRCS, *Consultant Urologist, Watford General Hospital and the Central Middlesex Hospital, formerly Senior Lecturer, the Institute of Urology, London*

D. B. Evans MB, BCh, MRCP, *Consultant Physician, Addenbrooke's Hospital, Cambridge*

H. Festenstein MB, ChB, MRCPath, *Reader in Tissue Immunology, The London Hospital*

N. O. K. Gibbon MB, ChM, FRCS, FRCS(Ed), *Director, Liverpool Regional Urological Centre, Sefton General Hospital, Liverpool*

J. A. Gleeson MB, BCh, MRCP, MRCPE, FRCR, *Consultant Radiologist, Westminster Hospital, London*

F. J. Goodwin MA, MB, BChir, MRCP, *Consultant Nephrologist, The London Hospital; Senior Lecturer in Medicine, The London Hospital Medical College*

J. G. Gow MD, ChM, FRCS, *Consultant Urological Surgeon, Liverpool Regional Urological Centre, Mossley Hill Hospital, Liverpool and Consultant Urological Surgeon, Writington Hospital*

W. Hately MB, ChB, FRCP(Ed), FRCR, *Consultant Radiologist, The London Hospital and London Clinic*

J. H. Johnston MB, BCh, FRCS, FRCSI, *Urological Surgeon, Alder Hey Children's Hospital, Liverpool; Lecturer in Paediatric Urology, University of Liverpool*

F. P. Marsh MA, MB, BChir, MRCP, *Consultant Nephrologist, The London Hospital; Senior Lecturer in Medicine, London Hospital Medical College*

R. G. Notley MS, FRCS, *Consultant Urologist, Guildford Hospital Group*

J. K. Oates MB, BS, FRCP(E), *Consultant Venereologist, Westminster Hospital, London and Addenbrooke's Hospital, Cambridge*

K. Owen MS, FRCS, *Consultant Surgeon, St Mary's Hospital, London; Consultant Urologist, St Peter's and St Paul's Hospital, London*

Michael Roberts ChM, FRCS, *Clinical Lecturer in Urology, University of Bristol; Urological Surgeon, Bristol Royal Infirmary*

T. Sherwood MB, MRCP, FRCR, *Consultant Radiologist and Senior Lecturer in Radiology, Institute of Urology, St Peter's Hospitals, and Royal Postgraduate Medical School, London*

K. E. D. Shuttleworth MS, FRCS, *Consultant Surgeon, St Thomas's Hospital, London and the Royal Northern Hospital, London*

M. Singh MB, FRCS, *Consultant Urological Surgeon, Whipps Cross Hospital, Leytonstone, London E11 1NR*

N. Slade MB, ChB, FRCS, *Clinical Lecturer in Urology, University of Bristol; Consultant Urologist, Southmead Hospital Group*

J. C. Smith MS, FRCS, *Consultant Urological Surgeon, Oxford*

Patrick Smith ChM, FRCS, *Consultant Urological Surgeon to the Bath Health District and Avon Area Health Authority (Teaching)*

J. C. Swann MB, BS, FRCR, DMRD, *Consultant Radiologist, The London Hospital*

R. T. Turner-Warwick BSc, DM(Oxon), MCh, FRCS, MRCP, FACS, *Surgeon-in-Charge, Urological Department, The Middlesex Hospital; Senior Lecturer, London University Institute of Urology, St Paul's Hospital; Senior Lecturer, Institute of Urology*

D. M. Wallace OBE, MS, FRCS, *Professor of Urology, University of Riyadh, Saudi Arabia; formerly Consultant Surgeon, St Peter's Hospitals, and the Royal Marsden Hospital, London*

R. H. Whitaker MA, MChir, FRCS, *Consultant Urologist, Addenbrooke's Hospital, Cambridge*

J. E. A. Wickham MS, BSc, FRCS, *Senior Consultant Urologist, St Bartholomew's Hospital, London; Consultant Urologist, St Peter's Hospital Group, London; Senior Lecturer, Institute of Urology, University of London*

J. P. Williams MChir, FRCS, *Consultant Urologist to St Peter's Hospitals, Greenwich and Lewisham Hospitals, London*

R. E. Williams MD, ChM, FRCS(Ed), FRCS, *Consultant Urological Surgeon, General Infirmary, and Leeds University (St James's) Teaching Hospital, Leeds*

W. Keith Yeates MS, MD, FRCS, *Consultant Urologist, Newcastle University Hospitals, Newcastle upon Tyne*

PREFACE

This book has been written for the surgeon intending to make urology his speciality, and for the established general surgeon who would like to keep up to date with recent developments in urological practice. In part, it is also an answer to the question—What is so different about urology that it needs to be regarded as a special field on its own, when by tradition it has always belonged to the main core and body of surgery? In recent years there have been so many changes and developments in urology that the man in training needs a secure base from which to make his forays into the confused jungle of the urological literature, and while there are many and excellent textbooks available from North America they write in a different surgical tradition and a different context of training and practice. Many of the changes in urology have come about as the result of developments in other fields, notably in radiology and nuclear medicine, optical and electrical engineering, endocrinology and genetics, immunology and nephrology, and the style of modern urology reflects its close working association with these other disciplines. Today, urology covers a wide field ranging from tumours to transplants, from histocompatibility to hypertension. To do it justice has meant a long book, even when we have omitted those introductory sections on normal anatomy and physiology which tradition often assigns to such a textbook and most of the operative surgical detail except where recent developments have occurred, or where older methods have been undeservedly neglected. To keep each chapter up to date has called for repeated revisions at every stage, a labour for which the editor is glad to thank his collaborators, as well as Mrs Sue Simpson and Mr John Staunton of Oxford Illustrators for drawing and redrawing some thousand or more illustrations; the staff of Blackwells, especially Mr John Robson and Mrs Diana Porter, for their friendly and ever cheerful guidance; and Mr Per Saugman, for having faith.

CONTENTS

CHAPTER 25

CONGENITAL ABNORMALITIES OF THE BLADDER AND URETHRA

J. H. JOHNSTON

1 ANOMALIES OF THE BLADDER

AGENESIS

Complete absence of the bladder is very rare. It results from defective development of the cloaca or of the primitive urogenital sinus early in embryonic life and is, therefore, usually associated with severe ano-rectal abnormalities and, in the female, with anomalies of the Müllerian derivatives. In five of Campbell's (1963) seven cases there was bilateral renal agenesis. In the male, the condition is usually incompatible with life because prenatal ureteric obstruction prevents normal renal development. In the female, the ureters may open into a persistent urogenital sinus and survival with incontinence is possible (Palmer & Russi 1969).

HYPOPLASIA

A very small, thin-walled bladder is found with severe degrees of epispadias and in the condition of bilateral single ectopic ureters in girls where both ureters open into the lower urethra. Under these circumstances the bladder remains underdeveloped since it has never been called upon to perform the normal functions of filling and emptying. When, however, the potentialities for carrying out these functions are restored, the bladder is capable of considerable enlargement and improvement in muscularity.

DUPLICATION AND RELATED ANOMALIES

These include a variety of developmental anomalies. The subject has been fully reviewed by Abrahamson (1961). With complete duplication (Fig. 25.1(*a*)) each hemibladder has its own ureter and urethra. There is often reduplication of the genitalia, of the lower alimentary tract and of the lower part of the vertebral column. In incomplete duplication (Fig. 25.1(*b*)) the two bladder halves communicate and the urethra is single. A complete sagittal septum (Fig. 25.1(*c*)) shuts off one chamber of the bladder; the obstructed kidney is usually aplastic.

An incomplete sagittal septum is similarly disposed but has a free lower margin. An hour-glass bladder has a horizontal constriction which divides it into upper and lower chambers (Fig. 25.1(*d*)). It may be simulated by a urachal diverticulum or by a fundus contraction ring which can be well developed in a hypertrophied, irritable bladder; on occasion a clear distinction from the latter is not possible (Fig. 25.2). An incomplete coronal or frontal septum partially subdivides the bladder into anterior and posterior chambers (Fig. 25.1(*e*)). A multiseptate bladder is divided by septa into several compartments, some communicating and some not (Fig. 25.1(*f*)).

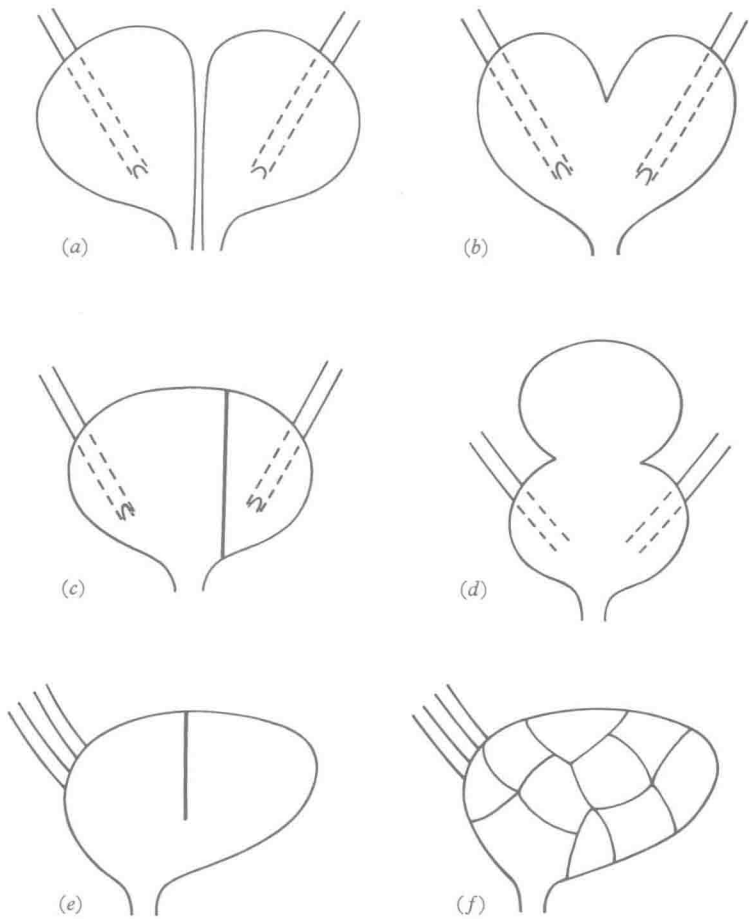

Fig. 25.1. Varieties of bladder duplication.
(*a*) Complete duplication.
(*b*) Incomplete duplication.
(*c*) Complete sagittal septum.
(*d*) Hour-glass bladder.
(*e*) Incomplete frontal septum.
(*f*) Multiseptate bladder.

The management of bladder duplication depends upon the circumstances in the individual case. Frequently there are upper tract anomalies and the correction of these and the relief of urinary obstruction form the most important aspects of treatment.

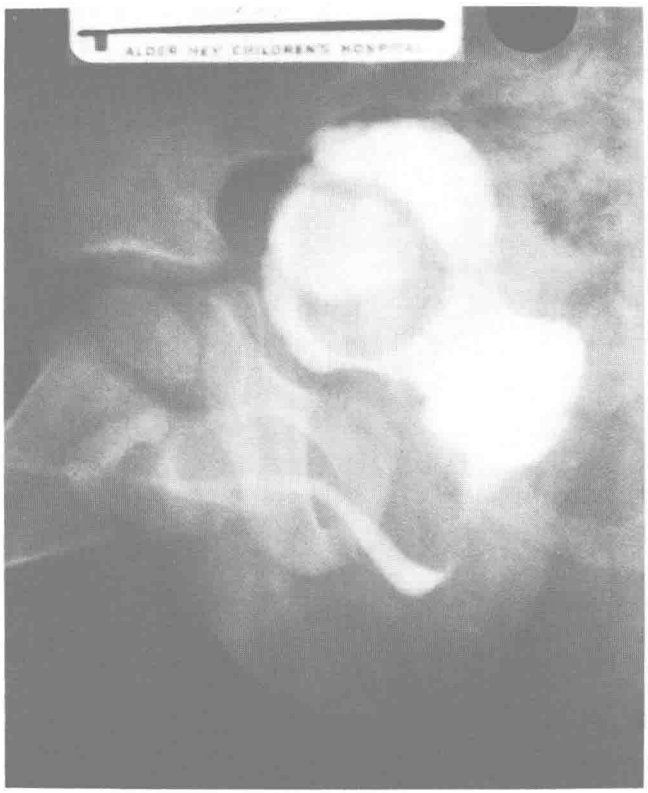

Fig. 25.2. Micturating cystourethrogram in boy with bladder calculus, showing annular constriction suggesting hour-glass bladder. The constriction was less marked but still present in the relaxed bladder.

URACHAL ANOMALIES

During its development, the cranial extremity of the bladder is continuous with the allantoic canal which passes through the umbilical ring into the body stalk. The allantois normally regresses, with obliteration of its lumen, but its connective tissue persists as the urachus or median umbilical ligament connecting the apex of the bladder to the umbilicus. Abnormalities of closure of the allantoic canal are responsible for patent urachus, urachal cyst, urachal diverticulum and, as a late complication, urachal carcinoma (Fig. 25.2).

Patent urachus

The allantois remains open. The escape of urine prenatally may cause great fluid enlargement of the umbilical cord which allows the diagnosis to be made at birth; in other cases leakage from the navel is noted after the cord has sloughed off. Urachal fistula may be associated with an infra-vesical obstruction but often it is an isolated anomaly. When it is secondary to obstruction, the fistula may close spontaneously after the obstruction has been relieved. Otherwise, operative closure is needed; often the bladder apex itself is found to be attached to the umbilicus.

Urachal cyst

The umbilical and vesical extremities of the allantois close whilst the intervening portion remains unobliterated and becomes distended by its own secretions. The cyst may present as an abdominal swelling or infection may occur and lead to a purulent discharge from the umbilicus. Intra-abdominal rupture of the cyst may occur, leading to peritonitis (MacMillan *et al* 1973). Treatment is excision of the cyst.

Urachal diverticulum

The vesical end of the allantois remains open as a vesical diverticulum. The communication with the bladder varies in size; when it is small, a calculus may

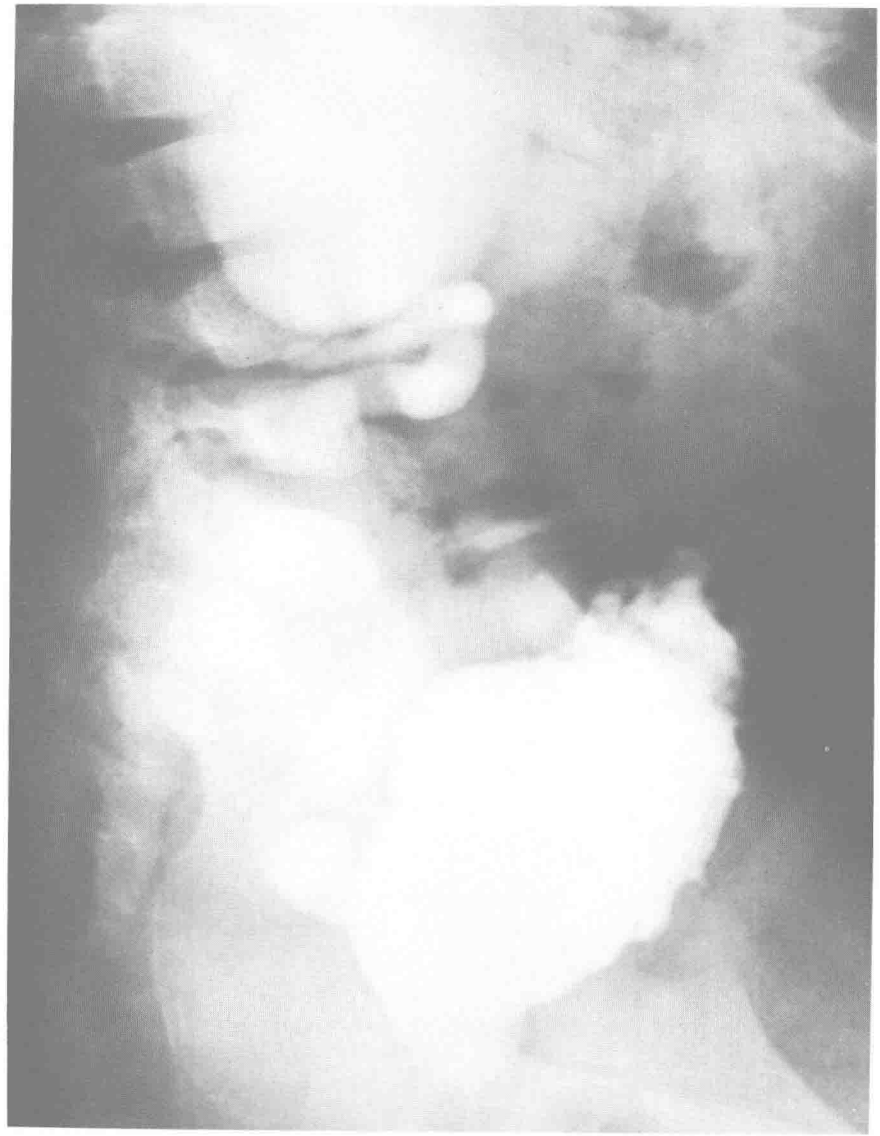

Fig. 25.3. Obstructive diverticulum and bladder sacculation. Cystogram in boy with neurogenic bladder. The ureteral orifice opens in the diverticular floor leading to ureteric reflux.

form in the diverticulum. A wide urachal diverticulum is seen in the defective abdominal musculature syndrome. Diverticulectomy is indicated in the presence of complications such as infection or stone.

Urachal carcinoma

This takes the form of a mucus-secreting adenocarcinoma which invades the apex of the bladder. The average age at onset is 50 years but Cornil *et al* (1967) have described a case in a girl of 15 years. The condition is reviewed by Beck *et al* (1970).

VESICAL DIVERTICULUM

A bladder diverticulum is a protrusion of the mucosa through an aperture in the musculature. In the child, as in the adult, protrusion may occur through a normal

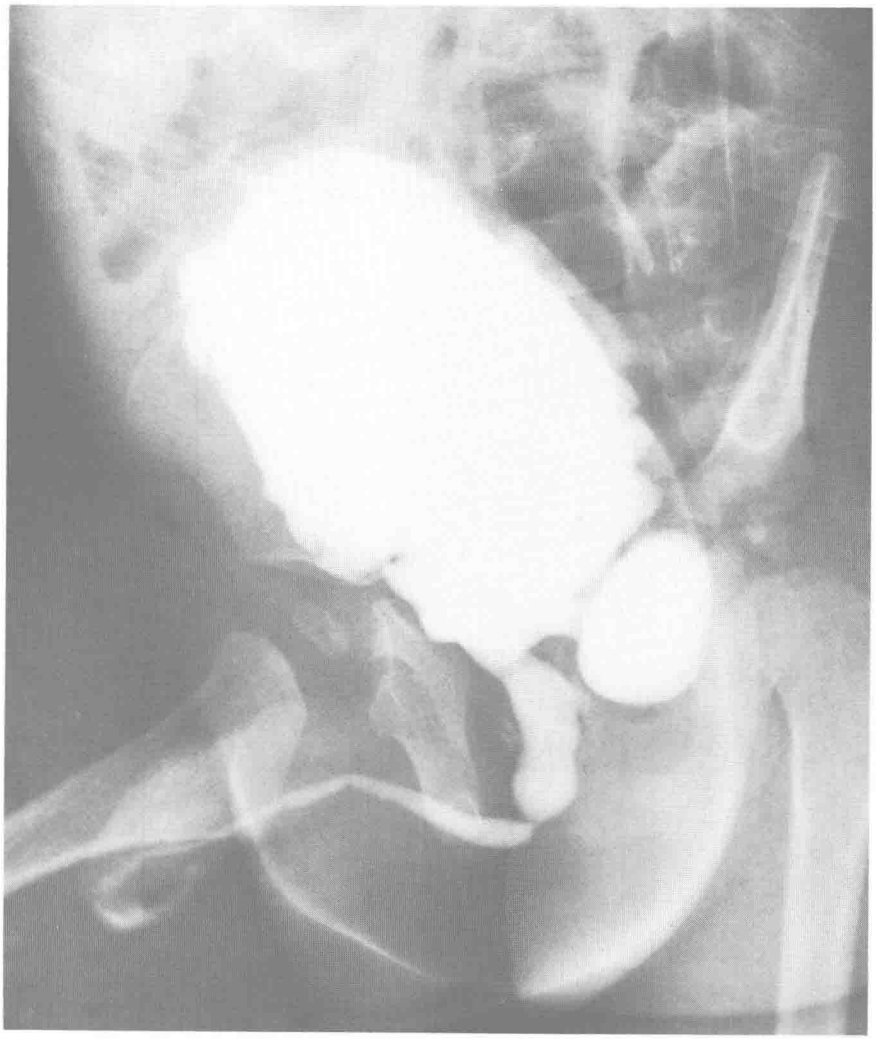

Fig. 25.4. Obstructive diverticulum. Micturating cystourethrogram in boy with urethral valves.

aperture in the presence of an abnormally high intravesical pressure but diverticula may also be found in children when the pressure is normal but there exists an abnormally weak area in the bladder wall. The following types are recognisable in the child.

Obstructive diverticula

These are found in the grossly hypertrophied, sacculated bladder which results from neuropathy (Fig. 25.3) or from a severe infravesical obstruction such as urethral valves (Fig. 25.4). The protrusions are usually bilateral, though not necessarily symmetrical, and occur through the ureteric hiatuses. As the diverti-

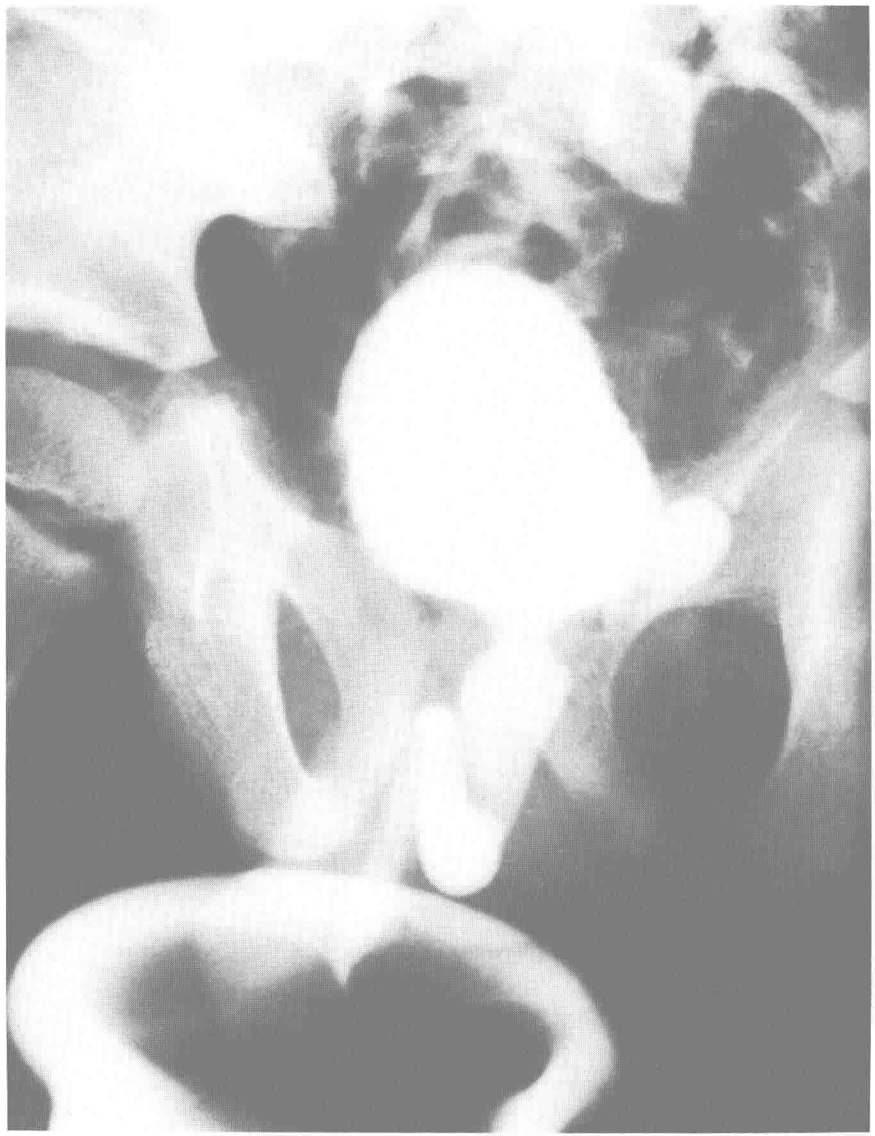

Fig. 25.5. Paraureteric saccule associated with primary ureteric reflux. Micturating cystourethrogram in boy.