REPAIR of GENITO-URINARY DEFECTS • Bankoff

PLASTIC REPAIR OF GENITO-URINARY DEFECTS

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PREFACE

I MAKE no apologies for this addition to the books dealing with one or other of the many aspects of the branch of surgery known as Reconstructive Surgery, for to my mind this subject is of such immense importance and the field it embraces so vast that there cannot be enough information on it made generally available.

Among the several reasons that prompted me to write a book on the *Plastic Repair of Genito-urinary Defects* two stand out as paramount. In the first place genito-urinary defects, both congenital and acquired, are not as rare as was thought only a few years ago. On the contrary, these defects are numerous and because of their physiological importance they must be dealt with efficiently and expertly if their twofold function as excretory and reproductive organs is to be preserved or made possible. The second reason for writing the book was simply to present, in one concise treatise, the information already available, so that the surgeon will not be forced to peruse almost every book on surgery in order to acquaint himself with methods of plastic repair on both congenital and acquired malformations or defects.

In planning this book my aim throughout has been severely practical, and I have tried to maintain the character of a concise textbook. For this purpose many operative techniques are illustrated only, without any detailed descriptions in the text, thus giving the surgeon a pictorial image of the steps that he must follow in reconstructing a genito-urinary defect.

How far I have succeeded only those who avail themselves of the book will know. For my part, I could ask for no better reward for the pleasurable labour of compiling these pages than that they should become as well-thumbed, dog-eared, and marginally annotated, and as much of a guide, philosopher, and friend in daily work, as were the note-books of student days.

In conclusion, I offer my sincerest thanks to the many authors whose methods and techniques I have followed. I hope those whose names have not been included in the bibliography will forgive the unintentional omission. May this Preface be taken as acknowledgment for the help their works have given me.

GEORGE BANKOFF

LONDON,
January, 1954.

INTRODUCTION

THERE is no definite sign in the development of the embryo which can be taken as the starting point of sex differentiation; it takes place so gradually and unobtrusively that it is very hard to determine exactly when it begins. The relation of the ostium uro-genitalis primitivum to the coronary sulcus and anal opening can be taken as one of the earliest manifestations of the external differentiation of sex. The ostium uro-genitalis grows away from the sulcus when the embryo is developing into a male, while it remains close to the anus if the embryo is to become a female. At the same time, the characteristic differences in the development of the primary excretory duct, the mesonephric remnant, the Müllerian duct, the three parts of the uro-genital sinus, namely, the vesico-urethral, the pelvina and the phallica, and the cloacal tubercle, gradually manifest themselves more clearly according to sex. These can be considered as the secondary changes in sex differentiation, and according to their more or less complete evolution the two sexes are determined. Occasionally this evolution stops short of full development, thus producing stages of hermaphrodism.

Hermaphrodism

The anatomical differences between male and female are very relative, and up to a certain stage of development these differences do not exist. In the early stage the embryo can be considered as unisexual and remains so until the sexual dimorphism begins to develop from identical structures in the two sexes. Considering the development of sex organs in this way, it is easy to explain the great majority of uro-genital anomalies. They are fundamentally hermaphroditic—possessing the rudiments of both sexes—where, through inhibition or stimulation of the male or female tendency of these rudiments, different types with incomplete differentiation of sex occur. A close study of the sexual rudimental structures shows the rich opportunity offered for all types of hermaphroditic anomalies to be produced. The failure of involution or inhibition of the growth of one or other sexual structure is fundamentally responsible for this anomaly, although so far we have not complete knowledge of the mechanism of such anomalies.

Hermaphrodism, on the other hand, can be considered as an

atavistic manifestation of an early inferior ancestral type, and the arrest of full sexual development can be the expression of an early adult individual. The early embryo, however, is unisexual and therefore the failure of suppression of the opposite sexual primordium can lead to several types of hermaphrodism. The early gonads with their primordial germ cells appear identical and yet they differ as regards sex in the number of their chromosomes. It is correct to assume therefore that the sex is determined actually at the moment of union of the male and female pronuclei, but their external manifestation is delayed in the early stages of embryonic development.

The study of hermaphrodism has gone further and has succeeded in introducing experimental artificial hermaphrodism. The latter can be achieved by the transplantation of glands of the opposite sex, which leads to the subsequent appearance of effeminate males or masculinized females, as the case may be. Both experiments and study of clinical cases show the role played by the sexual endocrine glands. On the other hand, the influence of the adrenal glands and the pituitary body upon the determination of sex is quite definite and important. According to Lillie, the sex of a female zygote can be reversed by the action of an opposite male hormone following fusion of the chorionic vessels with those of a twin male zygote. It may be said that all human beings are either beneficiaries or victims of mysterious chemical correlations and processes that are taking place in the endocrine system.

Classification of Hermaphrodism. There are several types of hermaphrodism which differ not only in degree but also in structure. Among the latter type there are cases which are closely associated with many other anomalies of uro-genital development and their classification is often very difficult. There is one classification, however, that must be recognized: namely, true and false hermaphrodism.

In *true hermaphrodism*, gonads of both male and female sexes are present. This group can be subdivided into various subgroups, which are known as the germinal or glandular true hermaphrodism. *Germinal* hermaphrodism may also vary in structure. In one type there is an ovary present on one side and a testis on the other. This is known as *lateral* hermaphrodism. Then there is the *unilateral* type in which there is an ovo-testis on one side and on the other side a testis or an ovary, or neither. The third subgroup is known as the *bilateral* in which both an ovary and a testis are present on both sides.

In *pseudo-hermaphrodism* the gonads of only one sex are present and therefore they may be considered as of the masculine type when the presence of testes can be determined, and of the feminine type when the ovaries are present. In both cases, however, the secondary sexual

characters are those of the opposite sex or closely resembling them. It is obvious from this that types of pseudo-hermaphrodism will vary greatly according to how complete are the secondary sexual characters. Again, according to whether the internal or external genital organs are those of the opposite sex, we have either internal types, or external or genital types. Among the *internal* we have the unilateral group, consisting of both masculine and feminine subdivisions. There are many transitional or combination types between a pure internal and a genital or external pseudo-hermaphrodism. Finally, there is the group known as the *psychic* and *somatic*. Among this group are types of normal anatomical female or male individuals but they possess perverse psychic and physical make-up and desires. Here it is sometimes very difficult to find any reason for the perverse sexual tendencies.

Fortunately, sexual anomalies of hermaphrodism are rare. True hermaphrodism has been found in the lower animals, and only eleven authentic cases in man are reported in the literature. Pseudo-hermaphrodism of the internal and genital types are also rare, although over 2,000 cases have been reported by different writers. Finally, the psychical and somatic group is more frequent, particularly in civilized nations and among Judaic and Mohammedan followers.

Simple malformations or congenital undevelopment of the external sexual organs must not be confused with any of the types of true or pseudo-hermaphrodism. Thus, for instance, hypospadias or epispadias in boys, unaccompanied by any other secondary sexual characteristics of the opposite sex, must never be classed as types of hermaphrodism. But one must not forget that these malformations if not corrected properly, and in time, may lead to aberration and sexual perversions, which later on will change the individual and bring him into the class of psychical and somatic pseudo-hermaphrodism. For this reason I have explained at some length the physiology of sex and hermaphrodism, because the object of this book is the early plastic correction of these malformations, which will save many unhappy lives and bring many a normal individual into the fold of society.

Physiology of Sex

To conclude the general survey of genito-urinary development a few words of the physiology of sex will not be out of place. Disabilities or impotence of the sexual function are more common in practice than is generally believed, and more often than not they assume serious proportions.

It is believed that the majority are purely of psychic origin and have no organic basis: those we leave to the psycho-analyst. But

there are others which are definitely due to some local abnormality of the genito-urinary tract. Both sexual disabilities, psychic and organic, may be classed into two main varieties: impotence affecting the male, and sterility in the male and female.

Sexual life in the male coincides with puberty, the age of which varies according to race and climate. As a general rule, we can take the age of 10 to 15 years as being the period of puberty in different races. Normal potency also varies not only according to race but to the life of the individual. Sexual vigour diminishes in some perfectly normal men after 45, and yet in others complete potency is retained to 65 and beyond. There have been known men with complete virility at the age of 90. Naturally potency is also influenced by health, strenuous work and diseases, particularly venereal diseases.

In normal coitus there are several factors that must be present. They are sexual desire, erection, ejaculation, and sexual satisfaction. The control mechanism is a very complex nervous one, and if any of these factors is abnormal or missing, normal coitus is impossible.

The immediate nerve centre for erection and ejaculation is in the lumbar portion of the spinal cord, but the exact mechanism by which the erection occurs is unknown. It is a complex combination of increased blood flow in the cavernous spaces and delayed venous outflow through the compressed veins. Individuals with complete severance of the spinal cord above the lumbar region can still have normal erection. On the other hand, sexual desire is cerebral in origin and is markedly influenced by the physical condition of the genital organs. Sensory influences of sight, touch and smell actually present or aroused by memory or imagination control the sexual desire. Whenever an erection occurs without sexual desire, it is pathological and is known as priapism. Sexual desire without erection, however, is also not infrequent and may be produced either by disease or fear acting as an inhibitory stimulus on the lumbar nervous centres. Erection of the penis depends on its anatomical structure which is highly specialized to fulfil the effect of venous blood engorgement.

Ejaculation may be considered as a co-ordination of the muscles of the epididymi, vasa deferentia, ampullae, seminal vesicles, prostate glands and bulbo-urethral glands of Cowper, and finally of the ischio-cavernous and perineal muscles. The true mechanism of this correlation is unknown, but all the muscles act simultaneously together with the secretion of the urethral glands, the outpouring of secretion from the bulbo-urethral glands of Cowper, the outflow of spermatozoa from the testes, ending in the climax of the sexual act.

The last of the factors for normal coitus is sexual satisfaction, which can be regarded as the culmination of a normal coitus. Physiologically, it is expressed in muscular impotence of the sexual organs accompanied by physical and mental relaxation.

Disturbance of Sex. Several factors may disturb the normal physiology of sex, and, according to their origin, we distinguish organic, endocrine, and psychical factors.

Among the *organic factors* the following may be considered in order of importance—

(*a*) Faults of production of spermatozoa, usually arising from faulty development of the testes, such as agenesis or cryptorchism; anomalies of the genito-urinary union, or acquired atrophy due to some local injury or disease. Faulty spermatogenesis can sometimes be due not to local but general diseases, or may even be present in perfectly normal individuals. This may be temporary as a result of previous over-activity, or permanent due to endocrine deficiency. On the other hand, spermatogenesis may be active but the sperm abnormal, being either scant (oligospermia), deformed (microspermia), or dead (necrospermia).

(*b*) Faults of transmission of spermatozoa may be due to either defective development of the genital tracts, which produces obstruction or deflection of the seminal flow; or acquired, by obstruction due to injury. Either of these congenital or acquired conditions may occur in the epididymis, vas deferens, or urethra. In the case of the first two, the obstruction must be bilateral: unilateral obstruction or malformation of the epididymis or vas deferens will not result in faults of transmission of spermatozoa.

(*c*) Faults of delivery of spermatozoa arise only through abnormal or defective intercourse. Occasionally a psychical impotence or failure of erection is the main cause in the male; but very often malformations of the external genital organs, such as hypospadias in the male or vaginal atresia in the female, are responsible.

The second group of factors responsible for disturbance of sex is due to *endocrine disorders*. These can be divided again into different subgroups, but they are mainly due to changes in the internal secretory activity of the testes, or to the effects of derangement of other endocrine secretions—

(*a*) Faults due to changes in the testes are mainly caused by hyperfunction or hypofunction of the organ which subsequently affects spermatogenesis. Hyperactivity, when manifested before puberty, leads invariably to sexual precocity and later to impotence. Hypoactivity, on the other hand, is responsible for an early form of

eunuchoidism if manifested before puberty. Post-adolescent hypoactivity of the testes will lead to an adult form of eunuchoidism, consisting mainly of azoospermia. In this latter group of hypofunction are all forms of impotence due to castration, either intentional, or due to disease of the testes.

(*b*) Faults due to derangement of other endocrine glands are only indirectly responsible for disturbances of sex, because of their action upon the normal function of the sexual glands. Some forms of Froelich's syndrome, where there is association of adrenal tumours, may show distinct signs of pseudo-hermaphrodism or even adult forms of eunuchoidism. These obviously are due to the influence of abnormal adrenal activity.

(*c*) Infantilism is another form of arrested development both in body and sexual organs. It is associated with pre-adolescent hypopituitarism, cachexia strumipriva which leads to hypothyroidism, myxoedema or medullary tumour of the adrenal gland. It is not to be confused with dwarfism, where, as a rule, the sexual activity is normal.

(*d*) Precocity, as the name implies, is the opposite of infantilism in regard to sexual activity. This may be associated in adults with cortical tumour of the adrenal gland, or in children with precocity due to hyperactivity of the cortex of the adrenal gland. Occasionally pineal tumours are also responsible for sexual precocity.

(*e*) Dystrophia adiposo-genitalis occurs in both sexes and is associated with disfunction of the anterior lobe of the pituitary gland. In the male it leads to eunuchoid tendencies and in the female to complete asexual desire. Forms of adiposis dolorosa and hypopituitarism with acromegaly may be included in this group.

The third group of factors in the disturbance of sex are due to purely *psychical* causes. These are of more importance because their frequency is often ignored and neglected by medical men. The sexual function is considered as highly psychic and yet, when its disturbance is not associated with gross organic malformations or endocrine disorders, it is frequently dismissed as purely neurotic or imaginary.

The disturbance of sexual function may be due entirely to this mental factor and often manifests itself in the form of a true vicious circle. An early mental conflict over sex and its physiological importance leads to mental abnormality, which in its turn causes impotence. Thus the physically normal individual, suspecting impotence, will find himself completely inhibited and unable to perform a normal sexual intercourse. Several factors are considered in this group—

(*a*) Masturbation; this self-indulgence of sexual pleasure in young

boys, especially if over-abused, may lead to many mental irregularities in sexual life. Although the act itself is not considered harmful organically, it leads always to mental inferiority complexes, self-accusation, reproach or feeling of guilt. All these may lead to a psychic anxiety which, if not properly treated, will end in complete sexual impotence. On the other hand, masturbation when practised in excess leads to early hypofunction of the sexual organ.

(*b*) Sexual psycho-neuroses are very complex mental derangements which belong to the field of the psycho-analyst. Forms of hysteria and psycho-asthenia are also considered as belonging to this group. On the other hand, true mental disorders such as paraphrenia or schizophrenia can have little relation to the sexual function and are compatible with normal sexual activity. The psycho-neuroses lead inevitably to sexual perversion, such as masochism, where sexual pleasure is derived by suffering pain, either self-inflicted or inflicted by another person; sadism, sexual pleasure obtained from inflicting pain on another person. Other abnormalities are fetishism, sexual excitement obtained by sensory stimulation; exhibitionism, desire of physical exposure of sexual organs, and homosexuality, preference for a sexual partner of the same sex. Sexual perversions are manifested by pleasure in abnormal intercourse, such as intracrural, oral (fellatorism), rectal (pederasty with boys), cunnilinguism, bestiality (intercourse with animals), necrophilism (intercourse with corpses).

Sterility

This abnormality exists in both male and female. Even if the sexual intercourse is normal, reproduction of the species is impeded. But there is an erroneous popular belief that where there is a childless marriage, the wife is to be blamed. Medically, the male is just as often responsible as the female partner.

In males, sterility may be due to azoospermia—absence of spermatozoa—which is either physiological, due to sexual exhaustion, or pathological, due to congenital anomalies or diseases of the sexual organs. Azoospermia is sometimes false, due to mechanical obstruction somewhere in the genital tract, or injury to the spermatozoa in its passage through the genital tract. Or again, function disturbance may be responsible. Organic lesions of the nervous system often lead to azoospermia.

In the female, sterility may be either congenital, due to malformation of the genital organs or absence of ovaries, uterus, or vagina, or acquired. In the latter case venereal diseases play the major part; in the majority of cases of gonorrhoea, blocking of the uterine tubes

is the rule. Psycho-neuroses are very seldom responsible for sterility in women. Only where an abnormal fear of pregnancy is present, sterility necessarily follows from active preventive measures adopted.

Recent investigations carried out by the author have shown that in a very small percentage of cases sterility may be due to excessive hypertrophy of the mammary glands. It would seem that the hypertrophied breast produces an abnormal substance which prevents conception taking place.

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PART ONE

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