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MEDICAL SURGICAL SUGGESTIONS.



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Vol. X.

DECEMBER 1941.

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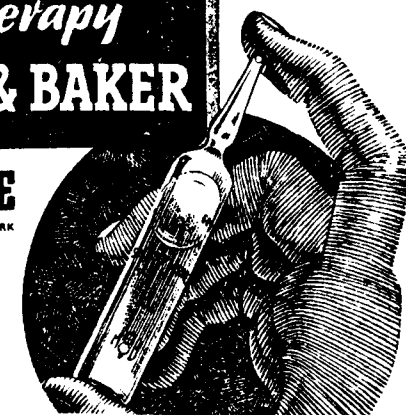
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A MONTHLY JOURNAL OF PRACTICAL MEDICINE & SURGERY
Editor: Dr. P. R. Venkappaya.

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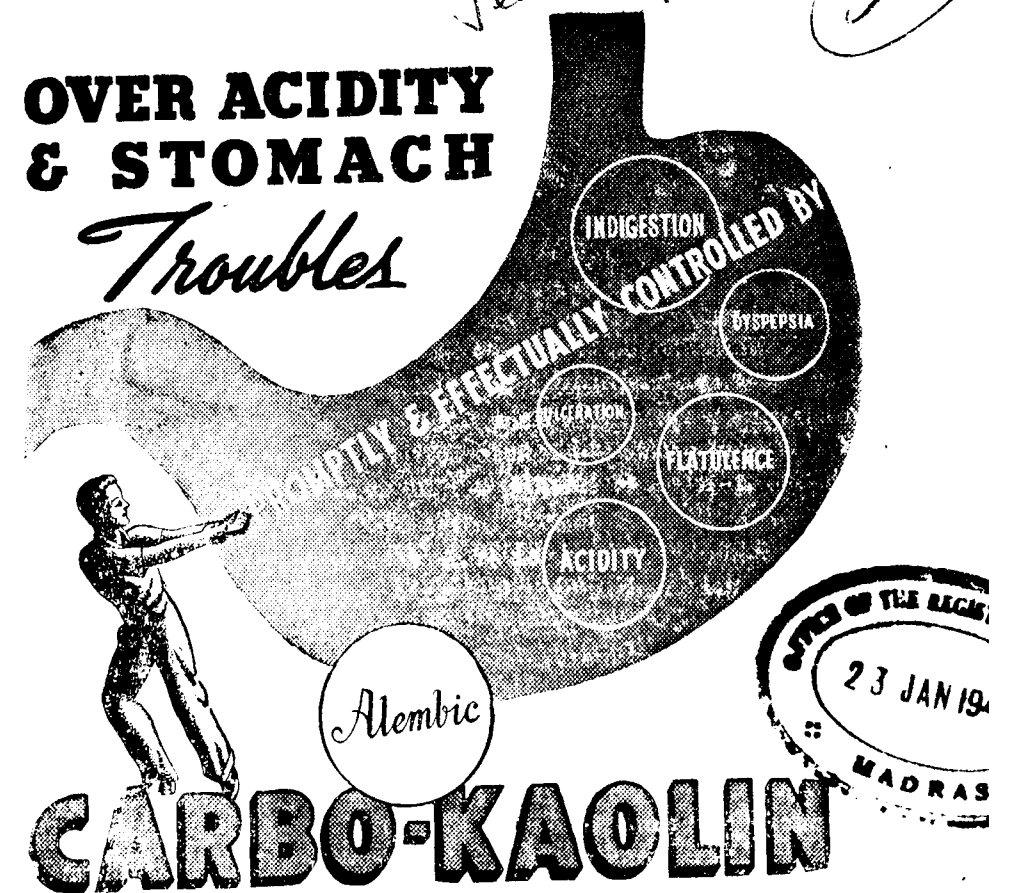
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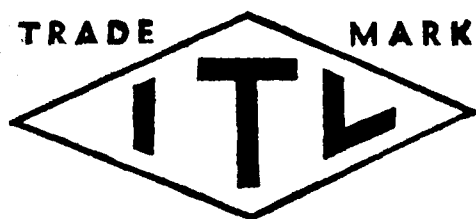
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MEDICO-SURGICAL SUGGESTIONS

(Established 1932.)

VOL. X

DECEMBER 1941

NO. 12

RETENTION OF URINE.

**BY DR. J. A. DHACKA, M.B., B.S., (BOM.), L.R.C.P., (LOND.),
F.R.C.S., (ENG.)**

Hon. Urologist Sir. J. J. Hospital, Bombay.

The act of micturition in adult is an act of highly co-ordinated conditioned reflex over which by education, training or habit, as we may call it, we have acquired a voluntary control either in initiation, completion, or inhibition. All of us are familiar with the gradual control that one acquires from early days of infancy, childhood and adolescence. A slight deviation from usual conditions either in matter of privacy, or embarrassing surroundings or a mental panic adversely affecting the smooth act of voiding the urine is a matter of every day observation and experience.

Physiology of micturition with applied anatomy. Considering micturition as a condition reflex like all other condition reflexes, till the time the conditioning such as influences of training, surroundings, graded the response and till the time the cerebral voluntary control developed in adult life, micturition is essentially an organic reflex in an infant and hence for simplicity could be considered to have like a simple reflex are (1) peripheral end organs (2) the afferent pathways (3) the centre (4) the efferent nerves; and the (5) effector organ.

(1) **Peripheral Sense Organs:**—It has been proved that as in skeletal muscles, the smooth muscles of the bladder has stretch sensations, and greater the degree of stretch greater the number of afferent stimuli in the afferent nerves; although the nature of peripheral endorgans in the bladder musculature has not been specifically proved, it can safely be deduced that with increasing amount of urine in the bladder, greater the distention of viscus, greater the intensity of afferent stimuli, greater the tone in the smooth muscle of the bladder and nearer is the threshold reached to effect evacuation of the bladder contents.

(2) **Afferents from the bladder:**—They pass along the sympathetic to the level of 1 and 2 lumbar segments, as well as along the parasympathetic routes the level of 1st and 2nd sacral segments, and

convey the knowledge of degree of distention of bladder and pain sensibility. As is well known, section of presacral nerves partially remove the bladder pain, and section of the sacral autonomic nerves completely remove the bladder pain.

(3) Centre is postulated in the lumbar enlargement of the cord, and is assigned powers to deal with the distended bladder till the pressure in the viscus reaches 15 cms. of water—when the threshold is reached, and further distention reaches consciousness and in adult according to environments the volitional control either to hold or evacuate the bladder comes into play. If it is inconvenient to evacuate the bladder, the inhibitory impulses pass down the cord, through the centre *via* sympathetic nerves to further elongate the muscle fibres thus diminishing the tone in them which causes fall in intra vesical pressure and the desire for the time being passes off.

(4) Efferents to the bladder pass mainly through the parasympathetic—although sympathetic also carry certain efferent fibres. The sympathetic have their cell station in the lateral horn cells of 1st and 2nd lumbar segments of the spinal cord. The fibres pass as medulated or connector fibres through the lateral sympathetic chain, though the semilunar and superior mesenteric ganglion, to form presacral nerve still continuing as the medulated fibres which arborise in the hypogastric ganglion on either side of the rectum. The parasympathetic have their cell station in sacral segment 2 and 3 and pass along nervi erigentes through the hypogastric ganglion without arborisation to the bladder.

Posterior urethra and external sphincter receive somatic supply through pudic nerve. (Volitional control).

(5) Effector organ the bladder ;

Physiologically the bladder may be considered to have the evacuating muscles, and the retentive muscles ; as in skeletal musculature the relationship towards each other *via* of reciprocal innervation and action holds good ;

The former comprises of Detrusor group and the trigone muscle "Henle" and the latter of the sphincteric group

With the contraction of the detrusors the intra vesical pressure increases, simultaneous relaxation of the sphincters opens the outlet of the bladder and is maintained open by the sustained contraction of the trigone muscle till the bladder empties.

Central Control :—In adults the voluntary micturition is effected in following way :—full bladder causing increase in the vesical pressure above 18 cms. of water, afferents pass up the cord as explained, and desire to micturition is felt somewhere in the region of the thalamus. The afferent pathway in the cord is believed to be somewhere in the vicinity of lateral columns. The centre for bladder control is believed to be in the motor area of cortex and in the upper part of the post central gyrus. The impulses pass down the tracts

in the vicinity of the pyramidal tracts, down the lumbar enlargement and the sacral segments *via* sympathetic and parasympathetic nerves. The detrusor muscle contracts. The internal and external sphincter actively relax. The trigonal muscle contracts thus opening the external sphincter and maintaining it open till complete evacuation of bladder is effected.

Thus we see that the micturition is likely to be adversely affected due to lesion in the neuro-muscular apparatus, and all along the nerves, nerve roots, cord and brain. Though commonly classified as "Non obstructive and Obstructive" varieties, retention is due to obstruction, though it may not be due to demonstrable macroscopic lesion such as fibrous stricture of urethra—etc. may be due to lesion along the neuromuscular pathway as shown above hence routine clinical investigation of the nervous system is essential to rule out majority of causes leading to retention. Used in a clinical sense, by retention of urine is nearly always meant as an obstructive variety, and is mainly considered in this discussion and only passing mention about other types will be made.

"Non obstructive retention" has to do entirely with the changes in the neuro-muscular balance of urinary apparatus as the results of central interference with the proper nervous impulses to the sphincteric muscles and is included in the term—Neurogenic Bladder—a term which has gained common usage to designate those bladder changes and disfunctions that occur primarily as a result of interference with sensory, motor or both impulses from or to the cerebrospinal centres having to do with the normal bladder function : It is unquestionably a better term than even more commonly used term "Cord Bladder" since it does not imply that the causal lesion is in the spinal cord alone, of course it is true that vast majority of such causal lesion is specifically in the spinal cord ; of course it is true that vast majority of such lesions are in the spinal cord.

Of the vast majority of causes, Tabes Dorsalis and injuries to the spinal cord are the principle factors causing non-obstructive retention of urine and the following need a passed mention such as (a) Transverse Myelitis (b) Syringomyelia (c) Disseminated or multiple Sclerosis (d) Spina bifida (e) G. P. I. (f) Primary lateral sclerosis (g) Acute Septomeningitis (h) in association with Achalasia of pelvic rectal sphincter or internal anal sphincter as in Megacolon. (i) Systemic diseases such as Pernicious anæmia, Addison's disease, Meningocoele, Diabetes, Gumma, Hæmorrhage of brain, Brain Tumour, and rarely lesions of peripheral nerves of toxic origin.

Thus in absence of local or obstructive etiological cause the relevant general examination, especially routine neurological investigation is necessary. The treatment will be directed towards the cause of retention. In many cases the treatment may prove to

be palliative, and it is not intended to discuss the management of such cases in detail here.

Obstructive retention:—The mental panic of an onset of the first attack of acute retention of urine, although it is painful, quite often exaggerates the appreciation of pain and is often responsible to lead the medical attendant into an indiscrete methods of treating the emergency in question with ultimate untowards happening or minimising the chances of judicious treatment of the condition causing retention.

It is very important to assure the victim that acute retention of urine is rarely if ever causes death, and the clinician must reassure himself of the fact that one never sees so dramatic an outburst from a patient experiencing a second or third attack of retention of urine as he had experienced the first time, hence meaning again that the emotional and psychological outburst of the patient suffering from acute retention should not be allowed to resort to methods of treatment which are unorthodox.

Judicious treatment presupposes the diagnosis of the cause and the cause of retention of urine is quite often obvious the age speaks for itself.

As indicated above, the causes of retention of urine may be classified as—

- (1) Retention with obstruction :—
 - (a) Prostatic :—
 - (1) Simple enlargement.
 - (2) Malignant disease :
 - (3) Stone.
 - (4) Acute prostatitis.
 - (b) Urethra :—
 - (1) Rupture.
 - (2) Acute urethritis.
 - (3) Stricture.
 - (4) Stones—Foreign bodies,
 - (5) Congenital malformation.
 - (6) Pinhole meatus.
 - (7) Extreme phimosis.
 - (8) Cysts of sinus pocularis and valves and folds.
- (2) Retention due to atony :—

With symptoms of nervous disease.
Tabes etc.
True atony.
- (3) Retention due to chronic intoxication :—

Appendicitis, Typhoid, Salpingitis,
Arsenic, Mercury, Lead or Belladonna poisoning,

- (4) Retention from inhibition or Spasm :—

Hysterical.
Post-operative.

Of the above causes—by training in clinical investigation one nearly always is able to focus one's attention to the relevant cause by observing few points on clinical investigation such as history, age, sex, duration, previous attacks if any,—associated stranguary, physical examination by way of inspection and palpation of genitalia, bladder region and prostate. It is always a good routine to go over the nervous system lest the patient may be **Tabetic**. Of the above causes, and with the above points in mind one quickly comes to a quick diagnosis of the cause of retention, and in practice common causes to deal with cases of acute retention are few and they will be mentioned as :—

- (1) Acute Urethritis.
- (2) Stricture of Urethra.
- (3) Enlarged prostate.

(1) Acute Urethritis :—

History of contact, usually young male, duration may be short as few days or few weeks before the exposure is likely to have taken place, may be that the first attack is associated with extreme stranguary (**Posterior Urethrotigonitis**). Physical examination may reveal — everted external meatus which is congested or other evidence of active gonorrhœa. Palpation and percussion of bladder region may reveal full bladder—per rectum no evidence of other complication (*viz* prostatic abscess.)

Treatment.

Convince the patient that although agonisingly painful, the condition is not fatal. Warmth, sitz bath and warmth to the loins and hypogastrium and morphia suppository. Alkaline Belladonna mixture, if the above measures do not succeed, then only wash the anterior urethra with acriflavine (1:3000), with all the precautions to avoid pushing the fluid above the compressor urethre muscle, preferably by finger in the rectum, and arranging the height of the irrigating can not more than 3 feet above the perineum—well lubricated, sterilized catheter gently passed and allowing the urine to escape slowly. Wash the bladder after evacuation and leave a few ozs. of antiseptic fluid in the bladder. Pass the rubber catheter as a last resort. never resort to metal catheter, subsequent treatment of acute gonorrheal urethritis should always be advised and rest in bed is of paramount importance.

(2) Stricture of Urethra.

Over and above the fibrous barrier there is always an element of spasm at the site of stricture and cedema, the latter two are especially prone to operate after exposure, intoxication and turgescence of the penis due to sexual act as it is not an uncommon story to

elicit from the patient that the attack soon follows the above mentioned precipitating causes which contribute towards the attack.

The problem presents firstly how best to relieve the acute retention and then how best to treat the stricture.

Treatment of Retention.

The patient who has had one or more attacks knows when another is impending by the beginning difficulty in micturition, inability to pass much of stream, later only a few drops and finally complete retention. The patient is in considerable distress and added straining in attempting to urinate aggravates the oedema and congestion about the stricture and bladder neck. Hot hip baths with sedatives often reduces the congestion about the stricture and allows him to urinate spontaneously. The relief may be partial and temporary and may recur very soon.

If the condition does not improve after half an hour or so in bath, manipulative insertion of a filiform bougie should be undertaken, after preliminary washing of urethra and coaxing one of the bundle of filiform bougie to engage in the stricture may succeed—if successful then the rest of the bundle removed, and the bougie fixed in, the urine will trickle by the side of the bougie. Urinary antiseptic should be administered and patient kept in bed for the period of at least 2 or 3 days for treatment, after the urine flow is fairly easy, if not free, later treatment of stricture.

If treatment by bougie fails, surely no attempt should be made to pass any metal instrument per urethra and choice of treatment is either suprapubic puncture by lumbar puncture needle or by trocar and cannula.

Suprapubic puncture by lumbar puncture needle is easily effected by puncturing the anterior abdominal wall in the median line just above the symphysis pubis, with preliminary small wheal of novocaine. This is certainly an ideal method of relieving the bladder in rural areas where patient may have to be relieved of acute retention till the time he is removed to a place where more elaborate and cleaner method can be resorted to that of suprapubic puncture with trocar and cannula of small size and an indwelling catheter. It is in the interest of the patient that when other methods have failed, suprapubic puncture should be avoided in urban practice for the reason that there is likelihood of leakage into the cave of Retzius, after the bladder is punctured and when the viscus is full again.

Puncture of bladder by trocar and cannula with indwelling catheter—if other methods have failed the insertion of trocar into the bladder is indicated. The trocar is inserted in the median line about an inch above the symphysis pubis, under local or preferably gas and oxygen, or pentothal sodium anaesthesia; a small indwelling Petzer catheter is introduced through the cannula which is then withdrawn, leaving the catheter in the bladder, and connecting the

outer end of catheter to a Kids inverted U tube and a side bottle. The patient is nursed in bed, for a few days and it will be an agreeable surprise that the patient in whom the filiform bougie could not be passed at the time of retention will easily be amenable to the treatment of stricture by dilatation.

Treatment of stricture does not come within the subject under discussion of an emergency, however the methods of treatment are :—

1. Intermittent dilatations.
2. Continuous dilatation at one stage.
3. Suprapubic cystotomy and retrograde dilatation.
4. Internal urethrotomy.
5. External urethrotomy.
6. Excision of stricture.

Permanent Suprapubic cystotomy for the time being in worst cases or when other methods have failed or cases complicated with fistula.

It is significant to note that the number of "impassable stricture" diminishes as one advances in experience and dexterity. The method of choice is intermittent dilatations. It is not proposed to discuss the suitability of other methods for relevant cases of stricture in this article.

(3) Retention of Urine due to enlarged prostate :—

This is a different problem. The patient usually has atonic bladder, super-imposed on chronic obstruction due to enlarged prostate, and residual urine. It is significant at this stage to appreciate the normal functions of the valve like fold of bladder tissue guarding the orifices of the ureters. In distended, atonic and dilated bladder the opening guarding the ureteric orifice becomes just a communicating channel between the reservoir of bladder and the secreting tissue of the kidney without any valvular effect, preventing the transmission of increased intravesical pressure caused when the bladder tends to contract while effort at micturition is made. Hence increased intravesical pressure caused at every effort at micturition is transmitted unhindered through the incompetent ureteric orifice, up the ureter, pelvis and calyces. Thus macroscopically the gross pathology of kidney known as hydronephrosis is caused by intermittent obstruction and back pressure. The increased pressure is likely to be transmitted through the collecting tubules, ducts of Ballini *via* loops to the glomerular capsule, which under hydrostatic pressure is likely to offer greater resistance to the filtering force of the capillary blood pressure of the glomerular tuft, thus the filtering force of the capillary pressure encounters greater pressure to secrete against and hence the quantity of urine is quite often less. Oliguria is further aggravated by greater absorption of the water content in the tubules due to greater pressure inside them (Pyelo—Venous back blow).

In cases where the patients having enlarged prostate have low blood pressure, the filtering force of glomerular tuft is likely to be low, also the venous capillary pressure round the collecting tubules is likely to be lower, sudden relief of obstruction that quite often happens due to rapid evacuation of bladder either by catheter or by suprapubic drainage relieves the secreting and conducting elements viz. glomeruli, the tubules, the ducts of Ballini etc. of the intra luminal pressure inside them, thus the veins around the tubules thus relieved of resisting force swell up; the glomerular engorgement takes place, thus compressing amass, the whole of the tubular paths of the kidney leading to blockade of all the channels of conduction, thus bringing about a condition of Anuria. It is not unusual at the post-mortem rooms to find both the kidneys severely congested in cases patients succumbed due to anuria following sudden relief of attack of retention of urine, achieved by Suprapubic cystotomy.

Suprapubic cystotomy apparently a surgical procedure carrying no mortality or a very negligible indeed, is therefore a procedure of major concern to the surgeon operating for the "first stage of suprapubic porstatectomy" and relatively of equal importance to the clinician, who relieves the over distended bladder of a prostatic in their rooms especially when the patient has low blood pressure hence the reasoning of slow decompression of the over full bladder, hence, never allow the urine to run free through the catheter, while relieving the acute retention of urine in a patient with enlarged prostate, if it has been done, it is advisable to put some non-irritating fluid back in the bladder.

It is not uncommon for the clinician to encounter cases where profuse hæmaturia follows after the so called first stage of prostatectomy or even after apparently harmless procedure of relieving the retention by a large catheter, it has been the sad experience of many a clinician to face such a catastrophe, and nearly invariably always these are the cases where the initial blood pressure was high, the capillary venous pressure it necessarily follows must be high the relief of intravesical and intra-luminal pressure of collecting tubules, the ducts etc, caused by rapid evacuation of urine leads to rupture of veins about the conducting and collecting channels, causing alarming hæmaturia.

Hence in patients with low blood pressure, anuria is not as potent a danger as hæmaturia in patients with high blood pressure and both can be avoided by exercising some patience and not to relieve the bladder suddenly.

There are no blanket rules as to how much to let out every hour, but it will certainly be safe to allow the urine to dribble by drops after passing a catheter, at least when the case is first seen and especially when the attack of retention of urine is first.

About the method of treatment of retention due to enlarged prostate there are hardly two opinions but to pass a suitable large size gum elastic bicaude catheter, with usual aseptic precaution, of course, this recourse be better preceded by milder measures such as hip-baths sedatives, morphia suppository, etc.

It has served a good help to inject few ozs. of fluid into the catheter by an assistant while pushing a well lubricated catheter up, and when encountering difficulty the fluid under pressure tends to straighten the curved and tortuous urethra or may be lifting up the so called ball of the ball valve type of middle lobe enlargement, but it has been found a serviceable adjunct to ease the passage of catheter in difficult cases.

No claim is made to say anything new, but there are certain facts which do bear repetitions and if retold with reason why to remain aware of them, they are taken to a good end.

STERILITY INVESTIGATION

BY G. WILSON HUNTER, M. D.

A Sterility investigation may be conducted by the general practitioner, and it may entail the services of the urologist, gynaecologist, general surgeon, and internist. Generally speaking, there are three causes of sterility or lack of fertility: (1) Defective germ plasm, ovulation or spermatogenesis; (2) Mechanical obstruction of the passage between the sperm and the ovum; (3) Unfavourable soil in the uterus for implantation of the fertilized egg.

HISTORY

Information concerning the menstrual cycle and sex habits is exceedingly important. While one cannot distinguish clinically between pseudomenstruation and true menstruation, one gets valuable data from the analysis of the length of interval, the amount and duration of flow, and presence or absence of pain. Pain occurring during the actual flow suggests a foreign body, such as a polyp, unshed endometrium or myoma, in the uterus. Excessive duration of flow, that is, over 5 days, or an increasing amount of hæmorrhage must always first suggest the presence of some lesion in the uterus or pelvic organs. It is necessary from the standpoint of sterility to inquire particularly whether coitus occurs in the estimated fertile phase of the cycle. Patients are questioned concerning the previous use of contraceptive materials, particularly as to whether a vaginal method was employed, and how long a period has elapsed since the patient ceased to use any contraceptive. It is also important to learn whether lubricants were being used to facilitate coitus inasmuch as the majority of lubricants in general use possess contraceptive qualities. Most patients will deny a history of

venereal disease, and indeed they may be unaware that they ever had such infection. Yet on inspection the examiner discovers such stigmata as inflamed Bartholin's or Skene's ducts, or a mucopurulent cervical discharge; such findings definitely influence his opinion and put him on the lookout for possible tubal damage or other sequelae of infection, important, factors in the sterility picture.

GENERAL PHYSICAL EXAMINATION

Thorough physical examination may occasionally reveal some contraindication to pregnancy, such as cardiac or nephritic disease. Patients suffering from constitutional diseases incline to sterility. For example, women with diabetes rarely become pregnant unless the diabetes is mild or under insulin treatment.

GYNAECOLOGIC EXAMINATION

The genital status should be noted and evidence of developmental anomalies and of inflammatory disease particularly sought. In gynaecologic examination, the real infantile uterus is uncommon but various grades of hypoplasia are commonly encountered. The hypoplastic uterus is usually indicative of endocrine deficiency resulting in genital underdevelopment. Multiple fibroids, tumours and cysts of the ovaries and inflammatory adnexal lesions may be discovered on bimanual examination. The inflammatory lesions may be a basis for absolute sterility. Uterine displacements, such as retroversions and antilexions do not play so important a role in the etiology of sterility as was formerly believed.

HUEHNER TEST

If the history and physical examination reveal no cause, one proceeds to the Huehner test. The patient is instructed to have intercourse, then to apply a sanitary pad immediately and come to the office within an hour. With a pipette, semen is removed from the vagina and cervix for microscopic examination. Two hundred to 500 sperms per high power field with more than 50 per cent. motile sperm are generally indicative of a satisfactory male partner. This test is enlightening in that it not only tells us about the motile sperm but also the effect of the female secretions on them. A Huehner test revealing a low sperm count, diminished or absent motility, and a high percentage of abnormal forms would direct us to further study of the male.

ENDOCRINE STUDY

The thyroid function should be investigated routinely. A low basal metabolic rate when treated often results in pregnancy. Biologic assay of blood and urine for study of ovarian and pituitary hormones, while desirable, is generally impractical at the present time.

TUBAL PATENCY

(a) Rubin test. This term is applied to uterotubal insufflation with air or carbon dioxide. It is usually done a week or 10 days

after a menstrual period. In normally patent tubes the pressure need go no higher than 100 m. m. of mercury. Higher pressures than 200 m. m. are not used and tubes are considered non-patent at this point.

(b) If non-patent tubes are discovered, one may resort to uterosalpingography to determine the site of obstruction. Viscous Skiodan is the most satisfactory contrast medium.

ENDOMETRIAL BIOPSY

Suction curettage is the simplest means of obtaining a specimen for study of the endometrium. This procedure may be performed in the office or in the operating room and does not require hospitalization. At the present time endometrial biopsy is the best means of determining whether a patient is ovulating. Since attention has been drawn to instances of anovulatory menstruation, endometrial biopsy has become one of the cardinal steps in a sterility investigation. The patient is instructed to come in a few days before the expected period. The finding of secretory endometrium would indicate corpus luteum influence and, hence, ovulation. On the other hand, a proliferative endometrium would suggest anovulatory bleeding and a probable cause of the sterility.

DETERMINATION OF THE TIME OF OVULATION

Several methods are used to determine this in addition to the endometrial biopsy. The simplest are: (a) Basal body temperatures recorded by taking rectal readings at the same hour each morning; (b) Study of vaginal smears; (c) Studies of pregnandiol excretion in the urine as suggested by Venning and Browne. The time of beginning corpus luteum function and, hence, ovulation, may be learned.

Whenever vaginal cornification and depression of the basal body temperature coincide, Rubenstein feels justified in assuming the existence of a maturing follicle. Whenever there is massive desquamation of vaginal epithelium and a sharp rise in temperature, he diagnoses ovulation. In 4 patients he found ovulation to occur during the menstrual flow. Intercourse was advised during menstruation, and pregnancy followed in each case.

TREATMENT

If the history reveals possible reasons, such as abnormalities in the menstrual cycle, attempts are made to correct these. Progestin may prove valuable in lengthening a short cycle and diminishing excessive flow. A patient with amenorrhoea may conceivably become pregnant but is not likely to. This condition can frequently be relieved by X-ray stimulation to the pituitary or ovaries or the administration of gonadotropic hormone.

Restriction of intercourse to the ovulation period, when this is known, may be effective. Any gross anatomic defects are naturally corrected. Karnaky states that the vaginal flora may be restored to

normal with Floraquin. Douches are usually inadvisable although some authorities recommend weak alkaline douches to provide a more favourable medium for the sperm, but this measure would in time invite abnormal flora in the vagina. Cervical erosions are treated and polyps removed. Cary uses repeated 1 per cent. silver nitrate applications to soften the cervical plug. Fibroids, if they do not prevent conception, may lead to miscarriage; hence, it is generally advisable to remove them as well as ovarian cysts.

In the male, spermatogenesis may be stimulated by anterior pituitary hormones. Prostatic massage may be resorted to.

Many authorities place great faith in the administration of wheat germ oil to supply vitamin E. While this vitamin has been shown to be of definite value in some instances, it is not a cure-all and one should not lose sight of other methods of treatment when indicated.

The correction of non-patent tubes is a difficult problem. Plastic surgery on the tubes in the hands of some men has yielded encouraging results, but by and large the best that one can hope for is pregnancy in a small percentage of the cases operated upon.

("Lancet," February, 1911.)



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PURPOSEFUL SPLINTING OF INJURIES TO THE HAND.

BY H. C. MARBLE, M.D.

Thirty years ago putting on a splint meant cutting a board splint about 2 feet long and padding it with a fold of sheet wadding or may be a folded pillow case. This was applied to the arm with the hand, wrist and forearm straight. The end result was a perfectly healed wound, a stiff wrist and fingers frozen in full extension—a hand with practically no useful function. Thirty years has brought about a wondrous change. The mechanics of the hand and the positions of greatest function are now known.

MINOR INJURIES.

In superficial injuries such as abrasions, burns and infections, rest is the greatest therapeutic agent known. Movement of the tissues, joints and tendons has a distinct tendency to continue disease and delay healing, and so immobilization of the part, plus elevation, promotes healing. The position giving the maximum of rest has been variously called the position of neutral muscular pull and the position of physiologic rest.

In the case of infection, a large poultice applied to the hand, making a dressing several inches in diameter, gives the hand warmth and firm immobilization. It must be changed at frequent intervals so that the condition of the tissues may be inspected and the progress of the infection studied. It may sometimes be reinforced with a metal or plaster slab to give further support and to prevent any motion at the joints.

Now that the value of chemotherapy is known, acute spreading infections of the hand and wrist may well fall into another group which may or may not do away with poulticing.

FRACTURES.

In the classrooms of the fracture clinic for many years physicians have heard this admonition in first aid: "Do not transport the patient until after he has been carefully splinted. Then reduce the fracture and apply a proper splint to hold the fracture in the reduced position. Keep the fracture splinted until healing has been established. Then instigate active motion."

I shall discuss briefly the splinting of some of the commonest fractures in the hand.

The Wrist.—The common fracture of the wrist is the Colles fracture. Reduction is accomplished by bringing the distal fragment into flexion-pronation, the styloid process of the ulna being used as a fulcrum. Experience has shown that after reduction has been accomplished it is best to splint for from ten days to two weeks with the hand in this position. Experience has further shown that after two weeks it is possible to restore the hand to the neutral position and a week after that to the position of dorsiflexion without

danger of losing the position of the bone. In general the splints used to maintain this position in my clinic have been of plaster of paris, one part spread on the back of the wrist extending from the upper forearm to the metacarpophalangeal joints and a similar splint on the front extending from the upper forearm to the proximal palmar crease. This splint is held in position by a circular bandage. In certain rare instances it is possible to maintain reduction of a Colles fracture in the neutral position.

Fractures of the carpus after reduction have been held in position in a plaster of paris splint extending from the forearm to the metacarpophalangeal joint with the wrist in extension and the metacarpal bones of the thumb fixed in extension and with the phalanges permitted to fall into the position of flexion. This position simulates the position of grasp.

Fractures of the metacarpal bones of all the fingers may be treated in the extended position.

Fractures of the proximal and distal phalanges, however, because of the peculiar anatomic structure of the tendon and the interossei and lumbrical muscles, are best treated in flexion. This is particularly true of fractures of the proximal phalanx of the thumb, which, in addition, should be brought into adduction. Sometimes, because of overriding of the fragment, it is necessary to apply traction, either in the form of a banjo splint made with adhesive plaster applied to the distal phalanx or by drilling a needle through the bony portion of the distal phalanx and then applying a banjo splint in which countertraction is obtained from a plaster of paris cylinder about the wrist and forearm.

In all these fractures, if traction is necessary, the hand must be held in the position of grasp and the traction applied in the line of neutral muscular pull to the end that the bones may, with the aid of the fascial tube and the muscles and tendons with which they are associated, be held in position for ultimate function.

INJURIES TO TENDONS.

Injuries to the tendons on both the volar and the dorsal portions of the wrist and hand are extremely common. The tendon heals quickly and willingly if the ends are approximated either by operation or by adequate splinting, but the splinting must be applied so that it relieves all tension and holds the hand in the proper position until healing is complete.

If the long extensors of the hand or the long extensors of the thumb are severed by laceration on the dorsum of the wrist, the hand must be splinted with the wrist in complete extension and the metacarpophalangeal joint similarly in complete extension. The thumb in its entirety must be maintained in its position of extension until the tendon has had an opportunity to unite firmly. On the other hand, in lacerations to the flexor tendons the hand must be held in

the flexed position with the wrist in flexion and all the joints of the fingers and thumb flexed without tension until healing is well established. For this purpose a plaster of paris or an aluminium splint may be applied to the back of the wrist extending from the forearm to the metacarpophalangeal joint. To this may be added a compression dressing at the site of the injury to relieve pain, prevent outflow of serum and promote healing.

INJURIES OF NERVES.

The three nerves which supply the hand are the radial, the ulnar and the median. One or all of these may be injured and cause dysfunction of the muscles that they supply.

The radial nerve is commonly injured above the elbow when the humerus is fractured. After such an injury there is immediate paralysis and dysfunction of all the extensor muscles of the forearm, with subsequent inability to extend the wrist, to extend the fingers at the metacarpophalangeal joint or to extend the entire thumb. Such a drop of the wrist should not be permitted to continue, for it causes overstretching of the muscles and tendons, and even when the function of the nerve is restored the muscles and tendons fail to function. Therefore, with an understanding of the function of the radial nerve, a splint must be applied which will put these various muscles in the relaxed position; that is, the wrist must be extended the metacarpophalangeal joint must be extended and the thumb must be brought into complete extension. How this is obtained is of little importance. Some prefer to put a splint on the volar surface of the hand to include the thumb. Others prefer to put a similar splint on the back of the hand but with an elastic appliance about the palm to allow exercise of the member.

The ulnar nerve is frequently injured at or about the elbow and as the result of an injury to the upper or lower part of the forearm. The ulnar nerve supplies sensation to the ulnar side of the hand, to the little finger and to one-half the ring finger. The motor portion of the nerve in the hand supplies all the intrinsic muscles of the hyperthenar eminence, all the interossei muscles and the two ulnar lumbrical muscles. Another motor branch crosses the entire palm of the hand and supplies the adductor muscle of the thumb and the short head of the flexor brevis pollicis. Therefore after an injury to the ulnar nerve the hand should be so splinted that the muscles thus supplied are put at rest. The thumb should be brought close to the index finger to relax the adductor, the metacarpophalangeal joints should be flexed at right angles to relax the interossei and lumbrical muscles and the middle finger should be semiflexed to relax the muscles of the hyperthenar eminence.

The median nerve, which is frequently cut in the middle of the forearm, at the flexor crease of the thumb gives off sensory branches which supply the thumb and the index, the middle and one-half the

ring finger and the medial half of the palm. Its motor branches, however, supply all the muscles of the thenar eminence of the thumb, one-half the flexor brevis pollicis and the two lateral lumbrical muscles—in other words, all the opponens muscles of the thumb. In order to put these muscles at rest the thumb must be brought into the palm of the hand so that it points to the ring finger. The fingers may be held in more or less complete extension. This position can be held by a simple bandage about the hand or with a leather support which will hold the thumb in the adducted position.

CONTRACTURES.

After burns, infections and crushing injuries to the hand, sometimes the muscles of the hand are brought into a contracted position, so that the function of the member is lost. If these deformities are associated with the joints or with the capsule of a joint or with the tendons, it is often possible to overcome this contracture by slow, steady traction with garter elastic. If, on the other hand, the contracture is associated with scar tissue crossing a flexion crease it is almost impossible to overcome this scar contracture by traction with elastic. The pull of the elastic must be slight, the direction correct and the rate of stretch slow. A slight amount of traction applied slowly over a prolonged period will produce far better results than a greater amount of traction over a shorter period.

MATERIALS FOR SPLINTS.

The large compression bandage with a basis of 2 to 3 inches (5 to 7.5 c.m.) of soft absorbent cotton bound firmly in place with a cotton elastic bandage gives excellent immobilization and a degree of compression which is useful in preventing swelling. This may be supplemented with a plaster, wood or metal splint. If adequate cotton is applied it is impossible to bind the hand so tightly that circulation is impeded.

Wooden splints are easily available. However, wood has its limitations in that it is difficult to bend.

Metal (sheet aluminium, 1/15 inch thick) can easily be cut with a pair of tin shears to fit the given case. With the aid of a hammer, a small vice and perhaps a drill and a file, it can be moulded and fitted to make any type of splint that is needed. Of course, it must be padded with felt. It is light and waterproof and offers easy passage to roentgen rays.

Plaster of paris is extensively used. There is a new plaster on the market which dries rapidly and is easy to mould to the hand or arm.

Castex is lighter than plaster of paris, is waterproof, and is particularly useful when a removable splint is desired. Thermex, can be melted by heat and moulded to the desired shape. It can be reheated and used repeatedly, is permeable by roentgen rays, and waterproof.

RESTORATION OF FUNCTION.

When healing has advanced sufficiently for one to feel that no simple procedure will destroy healing, actual voluntary use of the hand is the best method of restoring useful functions. In the hand, as nowhere else in the body, active use is the best method of restoring muscle power and co-ordination of this muscle power. What a man can and will do with his crippled hand has never, in my experience, been harmful. Occupation in a workshop, often with the splint still in place, hastens the restoration of useful function and obtains an optimum end result.

(*"Journal of the American Medical Association," March 29, 1941.*)

PROSTIGMINE WITH MORPHINE FOR ANALGESIA.

BY DONALD SLAUGHTER, M. A., J. C. PARSONS, M. D.,
AND H. D. MUNAL, M. D.

Much work has been done on producing a chemical which might serve as a substitute for morphine. The present report considers the use of prostigmine methylsulphate in combination with morphine in a series of approximately 100 cases.

Prostigmine is the dimethylcarbamate ester of m-oxiphenyltrimethyl ammonium methylsulphate. Pharmacologically it is similar to physostigmine salicylate in that it is a stimulant of the parasympathetics and has the power of inhibiting the cholinesterase. It does have the advantage over physostigmine of showing little, if any, miotic or untoward cardiac effects and of having greater stimulating action on the small intestine. Recently it has been shown by Schweitzer Stedman and Wright that prostigmine methylsulphate is the only therapeutic anticholinesterase drug which has a central depressant effect.

The use of prostigmine methylsulphate in myasthenia gravis is now well accepted. Recently it has been used with apparent success in the treatment of deafness. Further, its use to treat and prevent post-operative ileus and anuria is well established. The rationale in myasthenia gravis and postoperative use rests on the ability of this drug to protect acetylcholine against being destroyed by cholinesterase. The premise as regards deafness is not, at the moment, perfectly clear.

Since Slaughter and Munal recently reported that prostigmine methylsulphate potentiates the action of morphine on pressure-pain in cats, it seemed plausible to try out such a combination on the human being. That prostigmine methylsulphate is a safe drug in itself has been shown by Schwark, Tietze and others.

RESULTS OF TREATMENT

The patients in this study roughly fall into six groups: (1) trauma, (2) preoperative sedation, (3) postoperative treatment, (4) coronary occlusion, (5) miscellaneous cases, and (6) addiction.

1. *Trauma.*—There were approximately fifty cases in this series. They consisted of trauma due to gunshot wounds, stabbings, fractures (simple and compound), and other types of extensive trauma in which the pain made morphine mandatory. As a rule only 8 mg. ($\frac{1}{8}$ gr.) of morphine with 1 c.c. of a 1:2,000 solution of prostigmine methylsulphate was given subcutaneously. In these patients apparent relief of pain came on in from two to ten minutes. In other accident of cases of a similar nature in which only 16 mg. ($\frac{1}{4}$ gr.) of morphine was administered as much relief from pain was not obtained and the onset of relief was longer; i. e., from six to twenty minutes. These observations were made from the time of the injection to the time the patient expressed real relief from pain and discomfort.

Only one minor, aged 15, received this treatment. He experienced excellent relief and there were no untoward effects.

Preoperative Sedation.—There were twenty-five cases in this group. Most of them were gynaecologic but five appendectomies were included.

By trial, the administration of 5 mg. of morphine plus prostigmine methylsulphate four hours before surgical operation and repeated one hour before the operation proved unsatisfactory in producing sufficient sedation.

Further trials established the following routine as giving the most adequate preoperative sedation:—

1. Phenobarbital 0.2 Gm. the night before operation.
2. Phenobarbital 0.2 Gm. four hours before operation.
3. Morphine 8 mg. ($\frac{1}{8}$ gr.) plus prostigmine methylsulphate thirty minutes before operation.

This schedule appeared to give as good sedation as substituting 16 mg. ($\frac{1}{4}$ gr.) of morphine instead of the 8 mg. ($\frac{1}{8}$ gr.) plus prostigmine methylsulphate. At the time of operation this use of prostigmine methylsulphate did not interfere with any surgical procedure. All appendixes were removed in the gynaecologic cases, if present.

3. *Postoperative Relief from Pain.*—All these patients had orders for 8 mg. of morphine plus prostigmine methylsulphate on return from the operating room, to be repeated every three hours for three doses and then "as needed." There were five cases of moderate distention in this series following operation. These were relieved by the insertion of a rectal tube and the administration of 0.5 c.c. of a 1:2,000 solution of prostigmine methylsulphate every twenty minutes for two doses and then every two hours for four doses if needed. Only one patient required the use of a Wangenstein suction.

Coronary Occlusion.—Five patient with conditions diagnosed as coronary occlusion were treated in the emergency room with 8 mg. ($\frac{1}{8}$ gr.) of morphine plus prostigmine methylsulphate. All received relief within ten minutes. They then were given this combination every three hours "as needed." In none of these cases was it

necessary to order additional doses of morphine. Three received this form of treatment until death; i. e., from eight to thirty-six hours. The other two were discharged after a few days of hospitalization on this treatment. Previously such patients had always received 16 mg. ($\frac{1}{4}$ gr.) of morphine. We felt that the results of the combination were as good as followed the use of larger doses of morphine.

5. *Miscellaneous Cases.*—These included bronchiectasis, delirium tremens, kidney abscesses, nephritic pains, and the dressing of painful wounds. They required morphine. A typical case follows: A patient with nephritis suffered extreme lumbar pain which 16 mg. ($\frac{1}{4}$ gr.) of morphine did not alleviate. The combination of 8 mg. ($\frac{1}{8}$ gr.) of morphine plus prostigmine methylsulphate gave and maintained comfort.

6. *Addiction.*—Only one case of true addiction is presented. The patient was treated over a period of six weeks. He had urethral calculi with periurethral abscesses.

Six years previously he had gonorrhea, followed in one year by stricture of the urethra. At this time he entered the hospital for a urethrotomy. Soon after this operation, periurethral abscesses and a urethral fistula developed which persisted until the present time. At intervals, urethral calculi complicated the picture. The patient was an ambulance driver who gave no history of any drug habits before the urethrotomy. After operation he was given 10 mg. of morphine for pain relief. It became necessary to increase this dose to 16 mg. ($\frac{1}{4}$ gr.) of this drug. Shortly the patient became addicted and took as much as 30 mg. ($\frac{1}{2}$ gr.) at intervals. Three years of this habit brought his admittance to a government hospital. After the hospital discharged him as cured of the drug habit, his urethral difficulties returned and a physician put him back on morphine for relief of pain. He continued to take 16 mg. ($\frac{1}{4}$ gr.) of morphine. Six weeks prior to admission to the Robert B. Green Memorial Hospital, with the diagnosis of periurethral abscesses, urethral calculi and urethral fistula, he stated that he was taking 30 mg. of morphine every four hours.

A radical urethroplasty was successfully performed. Postoperatively he was placed on 30 mg. ($\frac{1}{2}$ gr.) of morphine. Two days later, 16 mg. ($\frac{1}{4}$ gr.) of morphine plus prostigmine methylsulphate apparently satisfied him. Reduction of the dose of morphine to 10 mg. ($\frac{1}{8}$ gr.) gave excellent results for four days. Further reduction to 8 mg. ($\frac{1}{8}$ gr.) did not suffice.

During this stage of the treatment he had not been told of the use of prostigmine methylsulphate but did comment that his bowel action had returned to normal. When he was told of this treatment, he co-operated well. The wound had healed after four weeks and the catheter had been withdrawn. Voluntary urination was instituted after two trials. At this time 10 mg. ($\frac{1}{8}$ gr.) of morphine

plus prostigmine methylsulphate was still being given and the patient did very well, complaining only of slight nervousness just before his dose. This procedure continued through the fifth postoperative week.

The sixth week 8 mg. ($\frac{1}{8}$ gr.) of morphine plus prostigmine methylsulphate was ordered. After the second day of this treatment the patient skipped every other dose without ill effects. He was then discharged to a government hospital for observation.

During the time prostigmine methylsulphate was used with the morphine, no withdrawal symptoms were noted.

COMMENT.

This study indicates that one-half of the accepted dose of morphine when combined with prostigmine methylsulphate in doses of 0.5 mg. gives as good relief as the larger dose of morphine. There were no side reactions noted. An order of 0.5 mg. of atropine was always written, but it was never needed. No apparent tolerance to morphine when used in this combination becomes evident.

There was one case of ruptured appendicitis complicated by peritonitis in which this combination gave satisfactory results. Saegesser has reported the use of prostigmine methylsulphate in a series of approximately thirty cases of peritonitis. He comments on the excellent results, and says that the untoward effects in this condition make this drug suitable for use as a prophylactic to lessen the danger of postoperative intestinal atony. In our series of cases there was none which showed ileus or anuria following operation.

In all but two cases the combination of prostigmine methylsulphate and 8 mg. ($\frac{1}{8}$ gr.) of morphine relieved pain. Twice in this series of 100 cases it was necessary to give 16 mg. ($\frac{1}{4}$ gr.) of morphine instead of the smaller dose; one was a case of extensive gunshot wounds and one of compound fracture.

While no untoward effects were observed following the use of this combination, it is felt that perhaps shock is a contraindication to use of prostigmine methylsulphate with morphine.

We feel that combinations of 1 c.c. of a 1:2,000 solution of prostigmine methylsulphate plus 8 mg. of morphine is an efficient pain reliever. Further, it is an excellent preoperative sedative and postoperative analgesic. When used before operation, it definitely minimizes ileus, distention and anuria. Levis and Axelman believe that without prostigmine methylsulphate from 60 to 75 per cent. of patients will suffer from one or the other of these conditions. Used postoperatively, enemas and the use of catheterizations are decreased.

The one case addiction treated with prostigmine methylsulphate lends encouragement to the use of this drug in similar cases.

("The Journal of the American Medical Association," March 14, 1941.)

Extracts.

EFFECT OF FOLLICULAR HORMONE ON NONPATENT FALLOPIAN TUBES

BY M. M. WHITE

In 1938, Clauberg reported the results of the action of large doses of estrogen on the fallopian tubes. His experiments were first carried out on laboratory animals. He showed that after several large doses of estrogen the fallopian tube in an infantile animal was elongated and its lumen widened. He then applied this treatment to women who were shown roentgenographically to have a small undeveloped uterus and nonpatent tubes. He assumed that owing to underdevelopment the lumen of the tube might be so narrow that lipiodol failed to enter. After five injections, each of 50,000 I. B. U. of estradiol benzoate, at five day intervals, a second roentgenogram showed patency.

Clauberg's theory is that estrogen stimulation induces hyperemia and hence increased development with expansion of the tube. He illustrated this result histologically by sections of fallopian tubes taken from women who had undergone a course of estrogen therapy as indicated previous to being operated on for some gynecologic lesion. These sections showed hyperemia and proliferation of tubal epithelium. He suggested that this treatment might be applied to improve the state of pathologic tubes in cases other than those of underdevelopment.

It is hoped that the hyperemia induced would so soften the tubes that when fine adhesions were present, causing obliteration of the lumen, the further instillation of lipiodol or the insufflation of carbon dioxide under pressure might break them down and so effect patency.

The author carried out experiments on these lines on 13 women. Rubin's insufflation apparatus was used to obtain the tracings. Lipiodol was injected into the uterus of 9 of the 13 women, and X-ray examination showed nonpatent fallopian tubes. The diagnosis was confirmed by insufflation in seven instances. The four other patients were not given injections of lipiodol before estrogen therapy was started.

Each of the 13 women was given a course of five estradiol benzoate injections, each of 50,000 I. B. U. at five day intervals. Four of seven women in whom nonpatency of the fallopian tubes was confirmed both roentgenographically and by insufflation acquired patent tubes, three having good tubal contractions and one poor contractions.

Patency and good contractions resulted in one of the two women in whom the tubes were shown to be nonpatent by insufflation only.

Of the four whose tubes were patent only at high pressure and showed no contractions, three subsequently had patent tubes at a lower pressure and showed contractions, but these were good in one instance only. In two of the cases in which patency resulted and good tubal contractions were obtained, examination of the husband's semen showed a poor spermatozoa count, the semen being below the standard required for successful impregnation.

(*British Medical Journal*).

INCIDENCE OF PEPTIC ULCER IN INDIA WITH PARTICULAR REFERENCE TO SOUTH INDIA

BY MAJOR J. R. DOGRA, M.D., I.M.S.

*Work done under the Indian Research Fund Association
From the King Institute, Guindy, Madras.*

In India, till not very long ago peptic ulcer was neither recognised nor looked for amongst Indians. Gastric and duodenal ulcers were considered rare. The pioneer work of Somervell, Bradfield and Pandalai, in South India, however, has made the surgeons in India 'ulcer conscious.' More cases are therefore being dealt with surgically throughout India and, consequently the disease is now recognised as of quite frequent occurrence. No attempt at estimating the incidence of the disease had been made in the past. In the present communication extensive data, made available by this inquiry, are presented with a view to indicate the incidence and distribution of the disease in various province in British India. This is considered to be of special importance in view of the most serious infirmities caused by this disease, the great crippling effects on the individual and the prolonged convalescence and consequent loss of man-power to the state.

In the absence of a village-to-village survey, in a vast country such as India with lack of easy and cheap means of transport between widely scattered villages and its ignorant and poverty-stricken population, even if all sources of medical relief are included, a correct estimation of the incidence of this disease is not possible. The medical relief centres where adequate facilities for diagnosis and treatment of this disease are available are very few and far between and it is not a matter of mere conjecture that large number of cases of this disease is missed. It is thus evident that, whatever the estimates, the actual incidence of the disease is likely to be much higher.

Material and methods. A proforma was circulated to all the provinces of British India, and statistics were thus collected.

Through the administrative heads of the medical departments in each province, original returns from hospitals and dispensaries were obtained.

It was recognized that such returns, particularly from outpatient dispensaries and small hospitals in outlandish places with their poor equipment and excessive attendance, could not be absolutely relied upon as far as the diagnosis of peptic ulcer was concerned. Again, owing to the medical profession, and the absence of any uniformity in nomenclature, a duodenal ulcer may be classified as such or as peptic ulcer, pyloric obstruction or even gastric ulcer. Further, although the disease was well recognized in the South it was not so in the North—as will be shown subsequently—a large majority of the so-called 'dispepsias' may be duodenal Ulcers. It was, therefore, deemed necessary to ask for returns of the total number of cases of the 'disease of the stomach' treated at various institutions sub-classified under the heading indigestion, dyspepsia, gastritis, peptic ulcer, gastric ulcer, duodenal ulcer, pyloric obstruction and jejunal ulcer. Figures for the calendar year 1939 were thus collected.

It must also be pointed out that the figures do not represent the number of patients. A patient on his first application for treatment is entered as a new case till he stops coming to the hospital. At all subsequent applications by the same patient for the same complaint he is again shown as a new case. Thus, as often happens in the case of 'stomach cases' the patient may be shown on two or three occasions in the returns.

Diseases of the stomach. The 1939 figures obtained especially for the purpose of the present investigation, show the distribution of the diseases of the stomach in the 11 provinces including in the two new ones, namely, the province of Sind and Bihar. These are per 10,000 of population, 71 in Bengal, 100 in United Provinces, 185 in Madras, 75 in Bombay, 165 in Bihar, 332 in Punjab, 69 in Orissa, 130 in Central Provinces, 111 in Assam, 290 in N.W.F.P., and 222 in Sind.

Peptic ulcer Cases. (a) All cases.—The term disease of the stomach includes a multitude of conditions varying from gastritis to an ulcer. Obviously the number of actual cases of peptic ulcer would be much less.

These figures are interesting in that Madras shows the highest incidence with 143, Bihar 37, Bengal 33, Orissa 23, Central Provinces 12 per 100,000 population; the Punjab and the North-West Frontier Province being the lowest, namely 9 and 1 respectively. The difference in the North and the South thus appears to be that of 1:15 and not 1:58 (McCarrison, 1921) or 1:600 (Somervell and Orr, 1936).

(b) Cases operated on.—The number of operations on the stomach carried out in the whole of India during the year 1933 to 1937 is

reported. This, however, is no criterion of the incidence in different parts of India.

Surgical treatment is not applied for or even agreed to by the majority of Indian Villagers. Except for a few centres adequate facilities for such surgical operations as gastroenterostomy and gastrectomy are not available. Again, only recently, the medical profession has recognized the frequency with which peptic ulcer occurs in this country and the efficacy of surgical treatment in this disease. In certain parts of the medical profession is still not 'ulcer conscious.'

The greater incidence of peptic ulcer in Madras, Bihar, Bengal and Orissa is noteworthy in contrast with the rest of India. The significance of this difference is not apparent. It may, however, be stated that in all these provinces rice is the staple diet and the common people consume a diet which is high in carbohydrate and low in protein content, whereas the conditions in the rest of the country are different. Again comparatively the ryot is very much poorer in these provinces. The greater incidence of ulcer in provinces where a high carbohydrate and low protein diet is prevalent is considered of importance with regard to ætiology of this disease in India.

(*Indian Journal of Medical Research.*)



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TREATMENT OF SCABIES.

USE OF SULPHUR LATHER TABLETS

BY DOROTHY CARTER, M.B., B.S.

Recently Assistant School Medical Officer Middlesbrough.

Scabies has become a war-time problem in England. In some places it has increased enormously say even 100 per cent. Scabies is a curable disease and the cure of the individual case is relatively easy, and yet the disease may be the most difficult to control. The control is difficult for the following reasons: (1) supervision of contacts is not given the same importance as the treatment of active cases; (2) 50 per cent of the cases never seek treatment and thus constitute a reservoir from which fresh cases are always arising.

The importance of control of the contact is increased by the fact that the war has caused a dispersal of the family unit. A family which before the war kept its scabies more or less to its own house now carries it to the army, the air raid shelter, and the reception area.

Infection is by contract. This must be close contact with an infested person's lesion or with his infested clothing, and must be long enough to allow the acarus to pass from one person to another, and to establish itself by burrowing in the skin. Thus infection will result from sleeping in the same bed as an infected person, using infested blankets—or wearing an infested person's clothing; it is possible that in some cases infection passes from clothing to clothing. Infested clothing remain infective for at least eleven days (Gray, 1940).

Importance of effective treatment. Scabies, which is frequently venereal is often regarded as a trivial disease. This is unwise. for the importance of scabies lies in the fact that while it is never a life destroyer it causes much loss of sleep—an important fact now a days. The cardinal symptom is intense irritation at night time. The scabietic child is pale, listless, heavy-eyed, and dull, not of course, only because of his scabies but because of loss of sleep and his perpetually irritating skin condition. Similarly, we can ill afford to let the war worker spend his days and nights scratching, with a resultant increase in nervous tension, lack of concentration, impairment of efficiency, and eventually loss of working time.

The ideal treatment must be: (1) short and effective to reduce the period of infectivity; (2) palatable to the patient who often has to be cajoled into taking it; and (3) must include all contacts and

clothing. It is futile to treat the infected person and leave the contact.

A new method of treatment. The treatment was first described in America (Nolan, 1937). The active principle is sulphur the old favourite. This is incorporated in a bland soap—amount of sulphur being 18 per cent—which is applied to the body in the form of a lather. As the lather dries a thin film of sulphur is deposited all over the body. Nolan had noted that on looking at a bubble of the lather the finely divided granules of sulphur could be seen, and as the bubble burst these granules were deposited on the skin. It was estimated that 4 grammes of the soap were needed to cover the body with a lather, whereas 85 grammes of sulphur ointment were commonly used.

Nolan estimated equivalent of sulphur as 0.72 gramme against 1.28 grammes. This meant not only a saving of material but less likelihood of sulphur dermatitis, as the amount of sulphur used was so much less. The author used, instead of a soap, a tablet in which the amount of sulphur suggested as adequate—that is 0.72 gramme was incorporated with a lathering agent. These tablets were used on twenty-nine unselected cases of scabies.

Procedure. First series of nine cases.

- (1) Each child was given a hot bath.
- (2) The child was removed from bath and lathered all over with the tablet, a foam being produced by rubbing the tablet between the nurse's wet hands.
- (3) Lather was allowed to dry, this took about five minutes in a warm bath room.
- (4) Clean Vest was put on.
- (5) Procedure was repeated on two successive days.
- (6) Verbal instructions were given to the parent about boiling the clothes and sheets.

Result. Cases were seen seven days after last bath; all cured. Average number of applications were three, average duration of treatment, four days. No case of dermatitis.

Second series of twenty cases. All children were given the treatment as outlined for the first series, but no one received more than three applications. The majority were given ung. zinc. B.P. or calamine lotion to apply for the week following the last bath. This was advantageous, as the skin often showed excoriations and scratch marks, although the scabies was cured.

Result. Out of twenty cases two defaulted. Eighteen were given three applications, and all were cured. One case had dermatitis, but this was not a case of sulphur dermatitis.

Comparison with other methods of treatment. Sulphur ointment. Its effectiveness is indisputable but it is not a treatment of choice for three reasons:

- (1) The use of ointment soils the under-clothing and bedding with grease. This combined with the pungent odor makes the treatment objectionable to many people.
- (2) There is likelihood of sulphur dermatitis.
- (3) All the burrows must be opened by preliminary scrubbing, otherwise the ointment can not penetrate.

Benzyl benzoate lotion. In cases with open sores or septic infection of the burrows the lotion proves too painful. Sometimes it has caused dermatitis.

Marcussen's ointment. Ung. Pot Polysulph. B. P. C. This like sulphur ointment is "messy" to use.

(British Medical Journal.)

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