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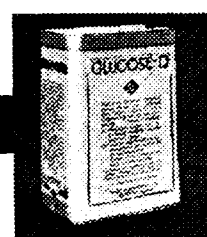
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MEDICO-SURGICAL SUGGESTIONS

A MONTHLY JOURNAL OF PRACTICAL MEDICINE & SURGERY

Editor : Dr. P. R. Venkappaya.

VOL. VIII

JULY 1939

No. 7

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NOTICE

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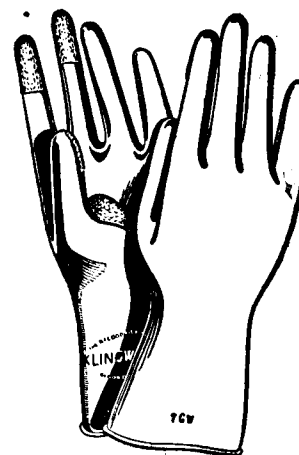
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ISIS holding a
Figure of Osiris
between her
wings.

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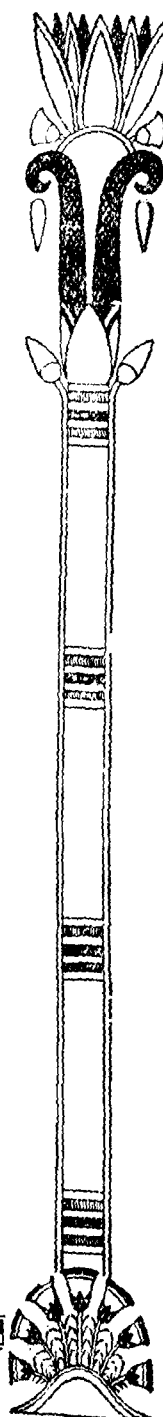
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MEDICO-SURGICAL SUGGESTIONS

VOL. VIII

JULY 1939

NO. 7

Original Articles.

"PYORRHOEA ALVEOLARIS."*

BY DR. S. K. GUPTA, B.D.S.C., B.O., (PB.)

*Surgeon Dentist and Laboratory Clinic,
Railway Road, PASRUR, District, Sialkote (Pb.)*

TREATMENT OF PYORRHOEA.

It must be made clear to the patient that the damage done prior to the treatment cannot be repaired and that the treatment can stop further progress of the trouble and that for the cure of Pyorrhoea his or her co-operation is as essential as the treatment by the Surgeon Dentist.

A. (i) Preventive or Prophylactic Treatment:—Scrupulous attention throughout life to the hygiene of the mouth is the best preventive. The teeth should be thoroughly brushed inside and out on rising, before and after taking meals and lastly at bed time. Clean teeth never decay.

The routine use of antiseptic mouth washes or tooth powders must be condemned. Great importance must be attached to the brushing and massaging of the gums, for it helps the free flow of the blood circulation.

In the presence of an unhealthy condition of the mouth, the use of Hydrogen Peroxide as a mouth wash or Iodine or Myrrh as a paint to the gums may be advised.

The accumulation of tartar should be prevented by regular visits thrice in a year to a well qualified local Dentist.

B. (ii) Curative treatment:—(Old Method):—

Local Treatment:—When once the condition has appeared prompt local treatment by a Dentist is essential. All the deposits on the teeth should be removed and the pockets flushed with a solution of Hydrogen Peroxide or a 2 per cent Carbolic lotion or Tinct. Iodine and alcohol or Chlorine water or Silver Nitrate 10 per cent solution in absolute alcohol. Common Salt (Sodium Chloride) is as good as anything to clean the teeth. Besides the patient must be instructed to scrupulously clean the teeth twice a day and apply massage to the gums.

* Continued from June '39 issue of the Journal.

Massage helps to squeeze the pus out of the sockets and to improve the tone of the surrounding tissues by bringing increased circulation to the part. This line of treatment is sufficient for the early cases.

(iii) General Treatment:—

It consists of the treatment of the constitutional troubles underlying it and aims at the elimination of the waste products of hyperacidity by the use of alkalies, opening out the bowels and elimination of the specific poison in the system.

Lastly when all the measures fail and particularly if the general health is involved, it is best to recommend extraction of the affected teeth.

Removal of the teeth:—My daily experience confirms the above statement and I do see many cases in my daily practice, improving in their health after the extraction of the teeth and putting on a new set of Artificial Dentures.

Specially the third molar and other molars if the membrane has been destroyed upto or beyond the bifurcation of the roots. Loose teeth and the teeth which cannot be kept clean should be removed. All the deposits accumulated at the neck and on the roots of teeth should be removed so as to check suppuration. Washing of the pockets with astringent mouth washes and massage of the gum removes purulent discharge and promotes a more normal flow of the blood and relieves congestion. By this treatment gums shrink and gets tightened round the neck of the teeth, pockets become shallow and hence purulent discharge etc., is not accumulated and is stopped.

Intermediate cases:—This stage starts from acute gingivitis to cases having their pockets deep and suppurating. Scaling of the teeth with perfect removal of tartar is essential only by a well qualified Surgeon Dentist.

Scaling of teeth:—All the precautions of cleanliness and sterilization of a surgical operation should be taken as regards cleanliness of the mouth, hands of the dentist and the instruments. Do not lacerate or in any way abuse the tissues. Each tooth must be treated separately.

Surgical Treatment:—This operation may be performed in hypertrophy of the gums or in cases, where teeth are not extracted

Advanced cases:—The best course is to have the teeth extracted (which have become loose by the infection and leading to necrosis of the jaw).

Tooth Brush:—If at all a hair tooth brush is used, which is not always necessary for cleansing the teeth.

1. It should be of a superior quality.
2. It should be cleaned very carefully both before and after use and should be used *up and down*.

3. A soft brush should be preferred and it should be still more softened by keeping it in a hot water cup before using.

4. Caution your patients against the wounding of the gums with stiff brushes and tooth-picks particularly during treatment.

In Punjab, Gujrat and Kathiawar fresh twigs of babul, Neem and banian trees with the bark on are used for cleaning the teeth. I give below a comparison between a vegetable and a hair tooth brush.

A vegetable twig's tooth brush versus a hair tooth brush.
Vegetable tooth brush. Hair tooth brush.

- | | |
|---|--|
| 1. Always fresh. | 1. Same daily, hence chances of sepsis inspite of careful washing. |
| 2. Contains Tannic Acid which hardens the gums (astringent properties). | 2. Absence of Tannic Acid. |
| 3. Needs chewing which improves local circulation | 3. Absence of chewing. |
| 4. It can be of the desired softness and so gums are not hurt. | 4. Chances of hurting the gums are many. |
| 5. Very convenient for brushing individual teeth in and out in every direction. | 5. Not so convenient. |
| 6. No fear of infection. | 6. Fear of infection. |
| 7. The tongue can also be cleaned by it. | 7. It is not possible to clean the tongue by it. |

NEW METHODS OF TREATMENT OF PYORRHOEA.

Surgeons at the front have sent a word that the correct procedure is to clean the wound and then protect it from later infection, doing at the same time all that may be done to stimulate tone, reinforce and strengthen the defending tissues.

In treating Pyorrhoea alveolaris by the old method powerful germicides and disinfectants and intensive scaling of the teeth was the rule. Good results seemed to follow in many cases at best temporarily, but the remedy often proved as bad or worse than the disease.

According to the new method all tissues must be treated gently and with respect. When invaders attack them beyond their own power of resistance they need to be strengthened, stimulated and encouraged, not poisoned by the administration of drugs of unknown potency.

Instead of using strong antiseptics like Carbolic Acid, Creasote, Argenti Nitras etc., the milder ones like the following are recommended:—

1. Oil of gaultheria (Winter-green) which is stimulating, astringent, mildly antiseptic and discouraging to bacterial growth.

2. Hydrastis which is the enemy of pus forming micro-organisms and empties pus-pockets.
3. Mag. Carbonate. It is tonic, astringent and antacid.
4. Sodium Carbonate. It is cooling, effervescent and stimulates secretions.
5. Zinc Sulphate. It is tonic astringent, and antiseptic empties pus-pockets.
6. Glycerine. It is emollient and mildly antiseptic.
7. Sodium Chloride (Common Salt). To be used as a mild antiseptic.

Of late years several treatment of Pyorrhoea Alveolaris have been tried and are given up as wanting. They are :—

1. Emetine Hydrochloride Injections.
2. Dietetic Treatment.
3. Surgical Method of Treatment.
4. Constitutional Method of Treatment.
5. Vaccine Therapy.
6. Quartz Light Therapy.
7. Ultra Violet Rays.

Now let us consider each of these methods of treatment for Pyorrhoea Alveolaris carefully.

1. *Emetine Hydrochloride Injections* :— It is used in $\frac{1}{2}$ per cent solution injected into the pockets after cleaning the teeth and it is also given hypodermically in $\frac{1}{2}$ grain doses until the symptoms abate and Entamoeba B disappears.

The defensive functions are inadequate to prevent the process and hence relapse occurs. The above treatment with the use of stock vaccines bacterin or auto-genous vaccines prepared from pus pockets, is useful. Cases in which spirochete are found, it is advisable to give intravenous injection of Neosalvarsan (provided the patient's condition does not contra indicate it).

Locally Hydrargyri succenimide in solution is used for pockets. Internally Calcium salts are useful in persons with lack of Calcium salts. (Syphilis, Pregnancy, Lactation).

2. *Dietetic Treatment* :—Alkaline dietary:—Take maximum fruits, grains and vegetables and have ample supply of calcium. If the diet is free from salts, meats and fine flour, there will be less chances of Pyorrhoea or Caries to occur.

Symptomatic treatment may also be adopted as symptoms arise.

3. *Surgical Method of Treatment* :—The surgical method of treatment as performed today by Dentists require the removal of all the tissues lying between the neck of the tooth and the tip of the alveolar process as revealed by the X-Ray. In this way, claim the advocates of this treatment, will Pyorrhoea, already acquired by approximately 75 to 90 per cent of those who have attained the age

of thirty and even be cured. The disadvantages of this treatment are quite apparent. There comes first the several laceration of tissues. The general practitioner will be shocked at the amount of soft tissue that at times has to be removed before the tip of the periodontal membrane can be reached, can any one imagine the results of this work in the hands of an unskilful operator? In cutting away the tissue around the roots the cementum is exposed and knowing the sensitiveness of the cementum how do our Dental Surgical Specialists propose cutting it admitting that at the time of operation the work is done quite painlessly what about the time when the anaesthesia passes? What about haemorrhages and what about the great danger of infection? With all these disadvantages some cases have improved.

4. *Constitutional Method of Treatment* :—Finally we come to the mode of treatment called the constitutional method. The entire treatment is based upon the supposition that Pyorrhoea is merely one symptom of a bodily disease that because the vital resistance of the individual is lowered pyorrhoea manifests itself. The advocates of this theory claim that when the body resistance is again brought back to normal that symptom which we called Pyorrhoea disappears. They proceed to bring this about by certain forms of dieting, together with medicine.

True, when the vital resistance is lowered one is apt to acquire many complaints but to assume that Pyorrhoea is a direct symptom of a lowered resistance is to my mind far-fetched. Pyorrhoea as a disease must be cured independently of any other disease and it happens to appear not only in the mouth of the person suffering from other ailments but also in mouths of those who are quite free from any other bodily affection.

5. *Vaccine Therapy Treatment* :—Stock vaccines, sensitized or unsensitized according to the age and condition of the patient is injected weekly or so, increasing or decreasing the dose as indicated.

Some prefer to begin with stock vaccines e.g., sensitized vaccine, initial dose about 250 to 750 millions, which is easily digested and assimilated by the tissues, free from local or general reactions and quicker in stimulating immunity.

If unsensitized vaccine is used the initial dose of 150 millions of mixed bacteria may be given.

If autogenous vaccine is used, have always the preparation from an experienced bacteriologist.

Pluriglandular extracts are also useful.

6. *Quartz Light Therapy Treatment* :—Having reviewed the different methods of treatment, observed the various disadvantages of each and realised the uncertainty of results in each method, it became a matter of necessity to arrive at some method which would procure results not in the isolated cases or in the incipient cases,

but in practically all cases. Quartz Light Therapy is the use of the actinic ray or what is called the Ultra Violet Ray in the field of medicine. It is called actinic because it belongs above the visible violet in the spectrum. It has as its marked characteristic a therapeutic property which today is being used so much in medicine and which is found so successful in Pyorrhœa Alveolaris. It is a known fact that the gum also gives off ultra violet rays and we have all heard of the famous sun bath given by the various tubercular institutions and the gratifying results obtained by them. The use of ultra violet radiation is not now in medicine but quite new in Dentistry.

7. *Ultra Violet Rays*:—The action of the ultra violet rays is based on the facts that;

(i) The internal organism is relieved by the blood being drawn to the surface of the skin.

(ii) The red corpuscles, after having received an increase in their energy content from the radiation carry away to the cellular elements of the body an increased amount of oxygen, and carry away from these cellular elements an increased amount of toxins.

(iii) The stimulation of calcium and phosphorus metabolism or in other words stimulation of the formation of bone tissue growth.

(iv) The destructive effect on bacteria, the fact that bacteria cannot live and thrive under exposure of the ultra violet rays.

With the possible exception of persons suffering from Diabetes ultra violet radiation results in the raising of vital resistance chemical action of ultra violet rays on the blood stream is such as to cause the haemoglobin to absorb the Ultra Violet rays freely increasing there by the oxygen content of the haemoglobin.

That the Ultra Violet rays is germicidal is very easily demonstrated. A dish with a thick growth of various bacteria has been exposed to the rays and the results when examined showed a complete destruction of these bacteria.

Method of treatment adopted:—First if the bridges are impinging on the soft tissues or fillings improperly placed, with their margins pressing on the gums or on adjacent teeth these are removed.

The next step after that scaling all the deposits around the neck of all the teeth should be removed thoroughly. It is advisable to enter as deeply as possible below the free margins of the gums with very fine scalers and remove as much as can be detected of the deposits there found. Scaling as thoroughly as possible is very important, because when tissue reparation starts we want no obstacles in the way and deposits are great obstacles. No deep scaling is required in Quartz Light Therapy as in the process of tissue repair, induced by the rays the deposits are absorbed and destroyed

Scaling having been accomplished we now begin our Ultra Violet radiation with the Kromayer Lamp. It is imperative before radiation that the lamp be allowed to burn for five minutes. The reason for this is that it requires fully five minutes of burning before the lamp has reached its full strength. The proper application directly on the spot to which we want our rays directed. The applicator is held against the soft tissues under gentle pressure. It is essential that pressure be exerted continuously while that area is being rayed, because the fact that Ultra Violet rays penetrate only a few m.m. below the surface of the tissue, unless the tissue are pressed. At the first treatment the lamp is held in position for one minute at each area that it is desired to treat. No more than three or four teeth are treated at one time. A second visit may be arranged for about 2 days or later. The same areas treated with the same pressure as before, but now for 2 minutes each. In this way he may be treated for a minutes time until a blister is formed or a marked improvement. If there is a burn or blister he should not be treated until a week.

Reactions:—The reaction that occurs of the light therapy is easily noted. About 4 or 5 hours after treatment a slight tingling or burning sensation is felt in the treated area and after about 2 hours the part turns red. Blistering should cause no apprehension for these blebs disappear after two or three days and the skin peels away.

Owing to the increased degree of immunity produced by repeated treatment, subsequent exposure do not produce burns but only a deeper tanning, but should long intervals of time elapse between treatments, the effect of an exposure will be the same as after the first treatment.

It is important to bear in mind that no local or systemic injuries can result due to even excessively long exposures as the rays can only penetrate a few m. m. of body tissue. No matter how large the bleb, no scars are felt as a result of it.

Dr. Folstein of New York says that Ultra Violet rays are:—(a) Antiseptic. (b) Bactericidal. (iii) Markedly analgesic and (iv) The rays are promoters of general metabolism by stimulating cell activity, by the promotion of phagocytosis exerting on oxidising action in the blood.

The entire mode of treatment by Ultra Violet radiation has a marked appeal to many patients because it involves no pain or discomfort and because of its positive results.

REFERENCES.

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- Burny and Yeo's manual of treatment.

PROBLEMS CONNECTED WITH THE DIAGNOSIS AND TREATMENT OF LEPROSY.

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INVESTIGATION.

When a patient presents himself with a depigmented macule the first problem before us is "what is this patch?" If one looks closely into this discoloration or decolorization one has to attend to the following points: general appearance and margin; scaling or non-scaling; disturbance of sensation as regards pain, light touch, heat and cold; if a hairy area, compare it with a corresponding area on the opposite side; does it sweat? The patient may volunteer to give some details. He might have noted that the part was becoming numbed, the hair thinned or shed, the part showed no sweating while the whole body was bathed in perspiration. In some patients, a hyperpigmentation, may be found surrounding the anaesthetic macule and here again a comparison with a corresponding area is necessary. It sometimes happens that while you are worried about the diagnosis the patient volunteers the information that he or she has had the patch under question from birth. I have seen a number of early cases who developed a hyperpigmentation on the face and sometimes of the whole body. It is also interesting to note that a patient who has scabies or tinea in a generalised form affecting more than half the cutaneous surface of the body, when the lesions are cleared by treatment, the patient will be found to be suffering from one of the types of leprosy. Here the patient has lost the protective sensation and he was not able to ward off the infection in the early stage.

EARLY PATCH.

The early patch of the maculoanaesthetic type is often ill-defined and the borders shade off gradually into the normal skin. The patch is not scaly and gives an impression of atrophy in the affected area. On one side or on the entire borders small papules may be detected. Very often diagnosis may have to be based on the appearance of the lesion gained by experience. Help may be obtained by searching on the proximal side of the lesion for thickened and tender cutaneous nerve twig or twigs. When this is found one may be greatly struck by the amount of thickening and tenderness of this peripheral nerve filament. The affection of the nerve is a secondary neuritis produced by the overgrowth of the fibrous tissue scaffolding by irritation of the acid-fast bacilli.

EARLY DIAGNOSIS.

A number of questions will now arise from the foregoing statements. Can one recognise and diagnose an early leprosy case with neuritis without the presence of a maculoanaesthetic patch? He will be a bold man if he attempts any such thing. Hundreds of things cause peripheral and other forms of neuritis in general medical field and one cannot attempt a diagnosis to bring us to a stage earlier than the appearance of a depigmented anaesthetic patch. There is nothing in the body of the patient to mark the entry of the infection comparable in appearance to the primary chancre in syphilis, and again in the later disease the actual date of infection from a correct history of exposure can also be determined. We are unable to attain this state of affairs as we are still groping in the dark as regards the method of transmission, and the portal of entry of infection into the system. In other words, as in syphilis and other infectious disease, we do not know the earlier stages of this disease. So, we are ignorant of the transmission, primary lesion indicating the entrance of the infecting organism and also the period of incubation. If the maculoanaesthetic patch results from a secondary neuritis caused by the presence of the bacilli in the nerve sheath planes, then we have to infer that the infection has been fairly long in the body. A mild bacillaemic stage precedes the anaesthetic patch stage. All types of leprosy, in their early stage, are maculoanaesthetic, i.e., maculoanaesthetic type. (N₁ of Manila conference classification) may pass on to N₂ and N₃ stages or become nodulated and pass on to more nodulations and confluence (leonine appearance) or yet again may result in mixed type. The present recognisable early stage is the maculoanaesthetic stages or N₁. I cannot go fully into the differential diagnosis for fear of consuming a large part of your time. One should keep in mind that in the irritative (neuritis) stage, the patch may be hyperaesthetic and not anaesthetic. I venture also to say that very often the thermal sensation becomes lost earlier than either light touch or pin prick. Doubtful patches should be examined once a month, and one will often find that the patch which had only a thermal restriction becomes anaesthetic to all the three forms of sensation, tactile, thermal and painful sensation. Congenital depigmented defects, early cases of leucoderma, tinea versicolor, depigmentation resulting from healing of all types of tinea and even ordinary simple injuries, and pigmentary disturbances of through endocrine dysfunction, dermal leishmaniasis, have to be kept in mind and eliminated. General avitaminotic conditions in children under 12 years usually produce a scaly patch, which leaves depigmented areas on healing. Most of these conditions are easy of recognition and anaesthesia is present in leprosy. Most of the early neural cases do not show bacilli from nasal scraping and smears from slit and curettage of the ear lobe and patch. Still in

unexpected cases, without ear lobe thickening, routine examination of the ear puncture gives positive results and this also may be borne in mind before dismissing the patient with a record of negative results.

I need not touch on the nodular type, as there are no problems in this connection. Curettage, smear and staining will fix the diagnosis. What is the significance of the presence of bacilli in nasal and pharyngeal smears? Are the bacilli being eliminated from the body by this channel or is the upper respiratory passage the point of entry and multiplication of the bacilli?

TREATMENT

Unless the disease is detected in the early stage (N_1 type), the treatment is not effective. Should we treat the early N_1 type? Opinion is much divided on this subject. Some advise keeping the patient under observation, while others are for treating the case to be on the safe side. I am with the latter group. If you treat a number of cases with N_1 type of lesions, while all things else are equal, their response to treatment is varied. Some show a disappearance of the patches with a few injections, while others require twice or thrice the amount. The number of external patches is no measure of the undeterminable systemic changes of the patient.

One cannot be interpreted as stressing the point too much if one advocates that general treatment is as essential as the specific treatment. When patients suffering from leprosy are given highly nutritious food, and their general hygiene improved, the disease undergoes a great amount of retrogression. I often wondered what benefit was conferred on pauper leprosy patients who attended the treatment centres when they cannot find a square meal a day and spent a large portion of their time in wandering about begging for food and sleeping in overcrowded places infecting others around them.

Chaulmoogra and hydnocarpus oil have remained our sheet-anchor. Patients who could take the oil by mouth without gastrointestinal upset, were those who derived the greatest benefit. Pure creosoted oil may be injected with profit and increased according to the tolerance of the patient. It is our custom to change the line of treatment only when the patient has become stationary on the above routine course. A mild protein shock with sterile milk, Aolan, Yatren-Casein, T. A. B. 10-20 millions intravenously once a week (all others intramuscularly) may be tried to get further improvement. Gold preparations as Auroprotasin, Lopion and Solganal B oleosum have also given good effects in resistant cases. A rest period is always necessary, say one month after an intensive treatment of 2 months. This period may be utilised in improving his general condition by tonics, rest, diet, etc.

The treatment of nodular cases has always remained unsatisfactory. Intradermal infiltrations of oil and diluted esters or iodised Moogrol have only shown partial success. Trichloroacetic acid pure may be painted on large nodules, but one is disappointed to see their reappearance in the same place or in some other part of the body. Depigmented patches may be painted with dilute solutions of trichloroacetic acid 1 in 2 or 3 or 4 according to reaction and part involved. Face will require dilute solutions. I have nearly ceased attending to patches, as specific treatment, when successful, will cause their entire disappearance and the cosmetic results are highly satisfactory. Their retention will serve us as an index to the success of our treatment.

Beyond rest and antiseptics, perforating ulcer still remains a great problem. The thickened epidermis surrounding the perforating ulcer may be shaved off or burnt with fuming nitric acid to initiate healing.

Lepa reaction rarely occurs in the ordinary course of leprosy. It is a bacillaemia induced by injudicious treatment and rapidly breaking down of granulomatous tissue releasing large amount of bacilli into the circulation. Treatment by antimony tartrate or intravenous injection of mercurochrome is all that is at present in use, but is far from satisfactory. I obtained good results in 2 cases by resting the patient and giving 7 to 10 units of insulin to get over the anorexia and allowing sips of glucose water frequently without the use of the above drugs.

ISOLATION

When room and facilities are available, nodular cases (infective ones) should be sent into a settlement to quench definitely the source of infection to others. Periodical examination, every quarter, of all contacts in an infectious leper's home, will help us to detect early cases and submit them to treatment in time. As most of the infection takes place in early childhood, all school children should be medically examined, and cases detected should be sent up to the nearest treatment centre till a satisfactory certificate can be issued. Good propaganda and a sympathetic medical attendant can contribute much to stamp out this scourge of mankind christened as the "Big Disease."

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THE HYPERTONIC INFANT

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The behavior of all newly born infants follows much the same pattern, barring gross pathological changes or birth injuries. The infant sleeps most of the time, and nurses when properly stimulated. There are no planned or purposeful movements. In short, he leads a reflex life. Toward the end of the second week—sometimes earlier—some infants begin to exhibit a set of characteristic symptoms which indicate muscular overactivity or hypertonicity. These infants are called "overactive" or "hypertonic." The condition is described as "vagotonia," "neuropathic diathesis," "autonomic imbalance," "enterospasm" or "gastroenterospasm." I prefer, and shall use the term "hypertonic infant" in describing this group.

The typical hypertonic infant has been described as long, lean and wiry, and also as being of the broad or sthenic type of body build. I have seen both types of body build, and I do not believe that habitus is a reliable physical sign in arriving at a diagnosis. The time of appearance of symptoms so often corresponds with the change in environment from hospital to home that this may be blamed for the restlessness.

Other peculiarities soon become evident. The infant raises his head, grasps objects that are placed in his hands, and kicks his feet so much that it may be difficult to keep him covered. When lifted from his bed, his body is stiff, frequently with the arms in motion and the legs and thighs flexed, so that it is difficult for the mother or attendant to hold him in her arms. When lifted by the shoulders, he seems to try to stand. When he falls asleep, which happens all too rarely, he awakens with a start and a peculiar little cry at the slightest noise or vibration of his bed.

Feeding the hypertonic infant is a difficult problem, and is often the cause for consulting a physician. He seems to be hungry all the time, and colic is a most troublesome symptom. If breast fed, it may be thought that the mother's milk is at fault. I have found that these infants are usually artificially fed a fact which may contribute to the condition, but which probably is the result of emotional strain in the mother. They may be classified as "just colicky." Tow mentions the fact that so-called "three months' colic" is thought to be a common occurrence, but that the colicky baby is frequently the hypertonic infant. A change from breast to artificial feeding, or changes in formula and feeding intervals may

be tried, and in some instances, with marked success. The types of artificial feedings that seem to have met with the most success will be discussed later.

Vomiting occurs often, and it may be the symptom that first causes worry for the parents, if colic has not already caused alarm. It is due to spasm of the pylorus and may be projectile or simply a regurgitation of all or part of the ingested milk. Sometimes, at the beginning of a nursing, the milk taken at the previous nursing is regurgitated or forcefully vomited, without effort or warning.

Although the gastrointestinal tract is in a state of hypermotility, constipation may occur, due to lack of muscular co ordination. Diarrhea has been described as being characteristic but is by no means constant. After leaving the stomach, ingested food is rushed through the intestinal canal to the lower bowel, where it may be retained, or frequent bowel movements may result from increased peristalsis or contractions. Constipation and flatulence may increase the colic.

Without treatment, the hypertonic infant often passes through the hectic first few months of life, reaching the age at which a nervous balance is attained. The harassed parents, who have spent sleepless nights walking the floor, filling hot water bottles and giving enemas, and themselves entering a new era of calm and peace. The formula being given at the time this change takes place is given credit for the transformation. One mother stated that her baby had suffered colic "night and day" and vomited most of the feedings, until the fifth month, when she started feeding whole cow's milk and abandoned the formula suggested by her doctor, which obviously hadn't been agreeing with the baby."

ETIOLOGY.

In the present state of our knowledge, attempts to determine a basic cause for hypertonicity in infants meets with only partial success. We know that the nervous system is implicated, and of the two great divisions of the nervous system (voluntary and involuntary), the autonomic nervous system is divided essentially into two great subdivisions—the cranio-sacral or parasympathetic, and the thoraco-lumbar or sympathetic. It supplies innervation for the structures which involuntarily carry on and regulate the functions necessary for life.

Through the 10th nerve (vagus) the cranial portion of the parasympathetic division supplies nervous impulses by which visceral organs respond to natural innocuous stimuli. The sacral portion is concerned with evacuation of the bladder and rectum. In general, it may be said that this division of the autonomic nervous system has an excitatory or stimulating effect on the stomach, pylorus, small and large intestines, but has an inhibitory action on the anal sphincter. On the other hand, the thoraco-lumbar or sympathetic

division has, in general, an inhibitory effect on contractions and motility of the stomach, pylorus and intestines, and an excitatory effect on the anal sphincter. Normally, the reciprocal action of these two systems allows for sufficient motility to carry the contents of the gastro-intestinal canal toward the anal sphincter at an optimal rate. In the newly born infant, they control defecation, since voluntary action has not yet been established.

Recent roentgenographic studies have shown that there is seldom evidence of a peristaltic wave in the normal infant stomach under three months of age. The stomach apparently contracts gradually in its entirety, forming a large tube as it empties. The pylorus is not clear-cut, and the usual triangular duodenal cap is rarely seen, since the pylorus and first portion of the duodenum to the right, in line with the contracted stomach. The ingested meal is often at the cecum in $1\frac{1}{2}$ hours, and the small intestine is empty in five hours. In the adult, the usual periods are three hours for the meal to reach the cecum, and eight to ten hours for the small intestine to empty. As a rule, in the infant, the meal has entirely left the colon in 24 hours. These findings would indicate that there is a normal predominance of parasympathetic action, more marked in infants than in adults. If this normal predominance of action is increased, we have the same hypermotility of the enterospasms of the hypertonic infant.

Autonomic imbalance is the actual *modus operandi*, but does not in itself explain the basic cause. Probably heredity plays a part, directly or indirectly. The increasing numbers of this type of infant may be an outgrowth of our hectic civilization, with its constant nervous strain. The endocrine system may also play its part. Laemmer has divided infants and children into two groups—those whose lives are controlled by the thymo-vagal system, and those controlled by the supra-reno-sympathetic system. That allergy may be a causative factor is strongly indicated by the frequent association of colic with eczema. In these cases, both the colic and the eczema are relieved when allergens are eliminated by appropriate regulation of the diet.

DIAGNOSIS

Although characterized by typical symptoms, the clinical picture of the hypertonic infant may be confused with others. Incorrect formulas often cause gastro-intestinal symptoms. Too high a percentage of carbohydrate often causes vomiting and excessive fermentation with diarrhea. Deficiency in carbohydrate is the cause of Finkelstein's "balance disturbance"—loss of tissue turgor, restlessness, loss of weight and occasional vomiting. Excessive fat in the formula may cause delayed emptying of the stomach, with decreased intake of food, regurgitation and apparent symptoms of colic. High protein content cause constipation, with attendant loss

of appetite, flatulence and sometimes vomiting. Over-feeding and underfeeding cause symptoms referred to the gastrointestinal tract, with sleeplessness and crying. Improper feeding intervals may also cause restlessness, crying and decreased intake of food, with loss of weight. Symptoms caused by dietary indiscretions are not accompanied by hypertonicity of the skeletal muscles, and are relieved by proper regulation of the formula and feeding intervals.

Spasticity due to birth injuries should not be confusing. A history of respiratory distress at birth, generalized or local twitchings, evidence of increased intracranial pressure and time of onset of symptoms, aid in diagnosis. Tuberculous meningitis may present a clinical picture similar to that of the hypertonic infant. In the former, other neurological and physical signs, suggestive of intraspinal and intracranial pathology, together with bulging fontanels should arouse enough suspicion to lead to spinal puncture and a correct diagnosis. Symptoms of other neuropathies and of myopathies do not appear as early, as a rule, as in the hypertonic infant.

Gastro enteritis causes colic with diarrhea; usually the cause may be easily recognized. Nasopharyngitis, otitis media and other infections frequently cause colic, diarrhea and vomiting. There are infants who develop a pernicious habit of ruminating, without other signs or symptoms. These infants may be recognized, if they are observed at the time of feeding. A characteristic movement of the lower jaw is seen immediately before the act of rumination. Infantile tetany (spasmophilia) presents a clinical picture almost identical with that of the hypertonic infant, and symptoms may appear at the same age. Opisthotonos, carpopedal spasms or convulsions may be present. Chvostek's sign is positive, and the blood calcium is found to be lower than normal.

Gastro enterospasm occurs in infants with and without manifestations of allergy. It is possible that the two groups may have a common causative factor, but until further evidence is advanced, I believe we are justified clinically in using the classification of P. J. White—"allergic" and "non allergic" gastro-enterospasm. To the latter group the term "hypertonic infant" is applied.

TREATMENT

Since most of these infants are receiving artificial feedings before a diagnosis is made, proper dietetic management is essential. It is unwise to experiment with various formulas or to blindly use prepared milks, without first determining what properties in the formula are most desirable. Easily digested food is to be desired, since it passes through the gastro-intestinal canal at an accelerated rate, and must be easily assimilated. It must be remembered that the caloric requirements of hypertonic infants are apt to be higher than in those who are less active.

Feedings thickened with cereal have long been used for infants who are called "ruminators", and in cases of organic pyloric stenosis, with success. White has used this type of feeding for hypertonic infants with marked success. He suggests that there is a possible colloidal-chemical effect, in addition to the mere fact that the feeding is thick. In his experience, age has been no contraindication to the use of thickened feedings.

Evaporated milk formulas are well tolerated in most cases, since the process of evaporation alters the physical properties of the milk, making it more easily digested. If it is found necessary to decrease the volume of feedings without decreasing caloric intake, this may be done by using lactic acid-evaporated milk formulas. The use of protein milk, or the addition of calcium caseinate to a simple milk mixture have been recommended. It is advantageous to add cereal, mashed ripe banana and pureed vegetables and fruit to the diet earlier in life than is usually done with the normal infant. Accessory vitamin-containing substances should also be added not later than the second month.

The feeding intervals may be hard to determine for these infants, since they may appear to be always hungry no matter how frequently they are fed. The interval should certainly be no shorter than three hours, and a four-hour schedule is preferable. Satisfactory gains during the first few months are hard to attain, because of the high caloric requirement. At times, it may not be possible nor feasible to maintain an ideal weight during this period.

In the more marked cases, dietary regulations and general measures may not suffice, and the exhibition of drugs may be necessary. Since it is known that the most distressing symptoms—those of the gastro-intestinal canal—are produced by gastro-enterospasm, the most logical therapeutic endeavor would be directed toward decreasing excitatory impulses from the nerves which are pressor to the visceral organs. Drugs known to have a depressing effect on the terminations of the para-sympathetic nerves are atropine, homatropine, hyoscyamus and scopolamine. Of these drugs, atropine is most satisfactorily employed. Phenobarbital, by its central action, accomplishes relaxation of the intestinal tract, but the continued use of a barbiturate may be objectionable. If used as a temporary measure, or in small doses, in conjunction with atropine, the elixir of phenobarbital may be employed for its added mild carminative effect.

In using atropine, the most convenient unit of dosage is 1/1000 grain. If a solution is employed, the prescription should be calculated so that teaspoonful doses may be given, rather than drops. For convenience of administration and accuracy of dosage, tablet triturates containing 1/1000 grain of atropine sulphate are recommended. The required number of tablets are easily mixed in a teaspoonful of water and administered when needed.

To secure results from atropine, the dosage must be increased up to tolerance, and a proper dosage maintained. The appearance of a blotchy or uniform rash, with fever and dilatation of the pupils is evidence of an atropine reaction. It is not a contraindication to the use of the atropine; withdrawal of the drug until symptoms have subsided is all that is necessary. The atropine may then be given in smaller doses and gradually increased. Tolerance to the drug usually increases rapidly. A diffuse red, scarlatiniform rash with slight elevation of temperature should be followed only by reduction in dosage, and not by complete withdrawal. It is not necessary to give the atropine 15 or 30 minutes before feedings, if adequate dosage is used. It may be given immediately before each feeding.

At first, one 1/1000 grain may be tried before each nursing. If there is a reaction, the drug should be withdrawn until symptoms subside, and then started, using half the previous dosage. The dose should be increased gradually, as indicated by symptoms, and by response to medication. In some cases, it is necessary to give as much as three 1/1000 grains before each feeding; in others, one 1/1000 grain before each nursing or even before every other nursing may suffice. With proper atropine therapy, the entire clinical picture undergoes a spectacular change. The nervous, crying infant becomes placid, takes feedings well, sleeps, and is obviously relaxed. Medication must usually be continued until the infant is 4 to 6 months of age. At this time, symptoms subside in the majority of cases.

Calcium has been recommended, but is preferably given by intramuscular or intravenous injection. Chloral by rectum is said to be efficacious, but obviously would be employed only in extreme cases, and as a temporary expedient. Paregoric has been widely used, mostly by the laity without, or against advice of the physician. It should be used only temporarily, and then only when diarrhea is a prominent symptom. Other drugs with an atropine-like action are advocated for smooth muscle relaxation and may prove of value in relieving colic. Further experimental and clinical work will undoubtedly give us therapeutic agents attended with less reactions and side effects than atropine and phenobarbital, which are now most extensively used.

PROGNOSIS

With proper management, at least a symptomatic cure may be effected, and immediate prognosis may be said to be good. Even without appropriate treatment, hypertonic infants may become symptom free, but habits of fondling, patting and floor-walking are so well established that it is difficult to tell when the infants crying is due to discomfort. These infants are usually poorly nourished, irregular in habits and much more difficult to manage than those in whom symptoms were controlled early.

Pyloric stenosis, being but a step further than simple pylorospasm, may occur. Whether spasm of the pylorus is primary and hypertrophy secondary, or vice versa, is still a question. Hence, it is not known whether or not frank pyloric stenosis may develop in untreated cases with pylorospasm, which is but one manifestation of hypertonicity.

Hypertonic infants probably contribute to, or are a part of the large group who become behavior problems. In these children having a neuropathic constitution, hypersensitivity to foreign proteins and to strains of environment is often manifested. Eczema, bed-wetting, night terrors' stammering, spastic colitis, and other nervous manifestations are seen. The intellect of the majority is average or above average. The temperament is usually high-strung and sensitive. They require more sleep than usual and never seem to be able to attain ideal weights on charts. Although there are no actual observations linking the hypertonic infant with the problem child described by Esther L. Richards, it would seem plausible that one might be the early stage of the other. Whether or not treatment in early infancy would affect the development of later symptoms could be determined only by careful observation and history taking. It is mentioned that in these older infants and children there is frequently a history of pylorospasm, rumination, sensitive, edgy temperament and hyperirritability. While not conclusive, these things certainly are strongly suggestive that many behavior problems started life as hypertonic infants.

SUMMARY

The hypertonic infant presents a clinical picture of muscular overactivity, beginning usually in the second week of life.

Autonomic imbalance is the immediate cause, but behind this, there is probably an hereditary, endocrine or allergic factor.

The most successful feedings have been cereal thickened and evaporated milk formulas. Atropine in physiological doses and phenobarbital have given the best results in drug therapy.

The hypertonic infant may later become a "nervous child", presenting behaviour problems.

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A COMPARISON OF THE INJECTION AND OPERATIVE TREATMENTS OF HERNIA

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A hernia is the abnormal protrusion of a viscus through its surrounding parietes, the protruding part being covered by a sac. The objectives in the cure of hernia are:

1. The replacement of the protruding viscus.
2. The removal or obliteration of the hernial sac.
3. The narrowing or closure of the parietal defect.

Both the operative and injection treatments of hernia are aimed at these objectives. At operation the protruding viscus is replaced, the sac is excised and the defect is narrowed or closed by the apposition of muscle and fascial layers with sutures. The injection method aims to maintain reduction of the protruding viscus by the use of a truss, to obliterate the sac and to narrow or close the parietal defect by the production of scar tissue.

The injection treatment of hernia dates back to 1835 when Velpeau observed a cure following the accidental introduction of iodine into the inguinal canal during the attempted injection of a hydrocele. He later experimentally treated herniae with iodine injections. In the next few years following, Joseph Pancoast of Philadelphia treated 13 cases of inguinal hernia by injecting Lugol's solution into the canal. Neither Velpeau nor Pancoast continued with this form of therapy. George Heaton of Boston in 1843 took up the injection method and in 1877 published a book on the subject. Because Heaton would not disclose his secret formula he fell into disrepute with the American Medical Association and was considered a charlatan. Joseph Warren of Boston, a disciple of Heaton, admitted that the latter's claims were exaggerated, but Warren himself obtained hernial cures with injections and described the method in his textbook published in 1831. In 1875 Gustav Schwalbe of Germany reported hernial cures following the injection of 70 per cent alcohol. Theodor Billroth, evidently recognizing the possibilities of the injection treatment, wrote in 1880 that the radical operation for hernia would be obviated if someone could obtain a solution to cause artificial proliferation of tissue. Mayer of Detroit, who used zinc sulphate and phenol solution, is credited with the modernization of the injection method about 1900. The injection treatment held the attention of only a few investigators and workers. The complications aroused fears. The type of questionable medical men practicing injections with unscientific methods promoted criticism. The poor results from paraffin injections, which became popular in the latter

part of the nineteenth century, brought disfavor. The profession became prejudiced and considered the injection treatment a quackery procedure.

Prior to 1874 when Lister acknowledged the value of Pasteur's work and introduced antiseptic surgery, operations for hernia were hazardous and confined mostly to cases of strangulation. In 1889 Edoardo Bassini and William S. Halsted simultaneously devised the modern hernia operation which reigns in favor today in spite of its numerous modifications.

Because it has been estimated there are in the United States five to six million cases of hernia that have not been operated upon, many of which are poor surgical risks, because of the apparently high percentage of recurrences after operation, because of the important place herniae have assumed in compensation medicine, because of the economic factors of expense and period of disability incident to operation, because of the fears and hazards of surgery, and probably for other reasons, the injection treatment has in the last few years received renewed interest.

Today nearly all physicians recognize and advise the operative treatment for hernia. Today the injection method has its proponents and opponents. After studying the subject one finds that considerable recent work has been accomplished on the injection treatment, new solutions have been used, the technic has been improved, experimental work has been done, the indications, contraindications and complications have been listed, and cures have been reported by recognized surgeons. The injection method, therefore, should not be dismissed without examination.

Many solutions have been employed and most of them depend on herbal extracts and tinctures combined with phenol and alcohol. The solutions have been classified as (1) acids in alcoholic solution or caustic salts (tannic acid, phenol, and zinc sulphate), or (2) mild soap solutions. The ideal solution which some claim has not yet been found, should be painless, noninjurious to tissues, nontoxic if injected into a vein or into the peritoneum, produce no systemic reactions, cause a minimum of exudate, and produce maximum proliferation of tissue and a firm scar.

The technic of injection is a definite procedure to be carefully followed and used by one who is competent and who has a detailed knowledge of hernial anatomy. The constant use of an accurately fitting truss that maintains complete reduction of the hernia is essential. The truss is worn sufficiently long to insure its efficiency before injections are begun. The Trendelenburg position is employed, the skin aseptically prepared, and novocaine used if desired. The finger is placed in the hernial defect to guide the needle. The needle is inserted in such a direction as to lessen its chance of perforating the peritoneum. The resistance of the fascial layers helps

to determine the depth the needle is inserted. The plunger of the syringe is withdrawn to insure the needle has not entered a vein or the peritoneum. The injection is made slowly and warning symptoms are inquired for. Other locations are used for subsequent injections. The dosage, frequency and number of injections are carefully determined.

The technic of the operative treatment is generally well known and need not be described here, but it too is a definite procedure to be practiced by one who is competent and who has a detailed knowledge of hernial anatomy.

For either method of treatment the selection of a suitable case is important. Operation may be indicated when injection is inadvisable and injection used when surgery is not applicable. Injection is indicated only in cases of reducible hernia and those capable of being retained with a properly fitting truss. Operation and not injection is advised in cases of irreducible hernia, incisional or ventral hernia with multiple openings, sliding hernia, hernia with large defects, and those complicated with strangulation or incarceration. The indirect and direct inguinal and umbilical herniae are best suited for injection, whereas operation may be used in any anatomical variety. An associated undescended testis calls for operation, and in obesity either method is hazardous. The injection treatment is better indicated in the extremes of age, in recurrent hernia and in poor surgical risks. Many patients objecting to surgery because of time and expense may be injected advantageously.

A number of conditions contraindicate either form of treatment—acute diseases, local skin diseases, serious organic or chronic diseases, such as blood dyscrasias, hemophilia, tuberculosis, malignant lesions, hyperthyroidism, diabetes not under control, asthma, bronchitis, chronic cough due to any cause, constipation, urinary retention, active venereal disease, psychoses, low intelligence, and lack of co-operation.

The advantages of the injection treatment are that it is (1) an ambulatory method, (2) more economic from the standpoints of both expense and loss of time from work, (3) avoids the serious complications of surgery, (4) is less painful, and (5) is applicable to patients in whom surgery is contraindicated.

Operation is advantageous because it is (1) a more scientific and accurate form of treatment, (2) definitely removes the hernial sac (3) successful as a result of the reapproximation of anatomical structures rather than scar tissue, (4) affords transplantation of the cord if desired, (5) less likely to do damage to adjacent structures, (6) avoids a long course of treatments and the use of a truss, and (7) gives better control of the patient during the treatment.

The objections to the injection method are enumerated as follows: (1) it is a less scientific or blind procedure; (2) it necessitates

the wearing of a truss which often produces local irritation; (3) it does not remove the hernial sac nor transplant the cord; (4) its success depends on scar tissue which may stretch or absorb; (5) the treatment is prolonged and the number of injections required is uncertain; (6) a change of address, sickness, accident or lack of funds may cause inadequate or prolonged treatment; and (7) the patient is apt to make his own decision as to when his hernia is cured.

The operative treatment has its disadvantages: (1) It requires more expense; (2) it produces a long period of loss of earning power; (3) there is a possibility of mortality, though low; and (4) it is not applicable to the aged or those who are poor surgical risks.

Both injection and operation are objected to because of (1) recurrences, (2) local reaction, (3) the possibility of complications, which are said to be greater with operation, and (4) the possibility of injury to adjacent structures, which may be greater in the injection method.

Most of the mentioned complications and sequelae of the injection treatment may also follow operation. Injury to nerves, blood vessels, peritoneum, spermatic cord, intestine, bladder, etc., is probably more likely to accompany the injection method. Infection and abscesses, hematmata, thrombosis and embolism, thrombophlebitis, swelling of the spermatic cord, testicular atrophy, impotence, sterility, hydrocele, orchitis, and epididymitis may complicate either method. The injection treatment may be followed by chemical peritonitis, sloughs and necrosis, ulceration of the skin from the truss, dermatitis, or hernial strangulation. On the other hand, operation may be complicated by respiratory infections, such as bronchitis and pneumonia, renal insufficiency or difficulty of micturition, and other postoperative complications, such as nausea and vomiting, shock, intestinal distention, sweating, etc.

Hernial cures are reported with both forms of treatment. The difficulties of obtaining accurate hernial statistics are recognized and are numerous. Therefore, the percentage of good results and recurrences is variously reported. It is generally believed that the number of operative recurrences is greater than is reported. The failures with either method may be due to (1) factors within our control, such as improper selection of cases, improper selection of the form of treatment, and poor technic, (2) factors beyond our control, such as age, obesity, atonic muscles and fascias, and failure of cooperation of the patient.

Experimentally it has been proved that injection produces a slight necrosis followed by an invasion of polymorphonuclear and round cells and later of fibroblasts, and the formation of fibrous and scar tissue. Nelson of Minneapolis showed that the fibroblasts invaded 8 days after injection and that dense scar tissue was formed in 42 days. In 1929 Hall and Fraser of New York found the reaction to a tannic acid solution to consist of proliferation of endothelial and

connective tissue cells with large mononuclear phagocytes and foreign-body giant cells. They stated that experience with foreign-body granulomas in general proved that this type of tissue reaction did not lead to malignant neoplasm to any greater extent than any other form of chronic irritation. Bratrud of Minneapolis stated in 1937 that the phenol-thuja solution, compared to others, produces earlier necrosis but denser and tougher fibroblastic tissue.

McKinney of Minneapolis reported, in 1937, 300 cases injected over a period of 3½ years with 83 per cent cures. Rice, also of Minneapolis, stated in 1937 that in several instances it was found, at a later operation for appendicitis, that the hernial sac had been obliterated by previous injections. Rice and Larson also reported that at operation in 30 cases, previously injected, the spermatic cord was perfectly normal. In 1936 Harris and White of San Francisco stated that injections into the peritoneal cavity of guinea-pigs produced no pathology as proved afterwards by negative autopsy findings on the animals.

In 1936 Kelly, Pratt and Palmer of Detroit, using the common solutions on dogs, produced fibroblastic proliferation in 10 to 20 days, but they reported that it had almost disappeared in 50 days and in 100 days had completely disappeared. They concluded that the proper solution had not been found. Burdick and Coley of New York stated in 1937 that in 8 cases, operated upon sufficiently long after injections had failed to permit subsidence of proliferative changes, there was no clinical nor microscopic evidence of a strong bulwark of built-up scar tissue as claimed to result from injection. They have abandoned the injection treatment until statistics are forthcoming that point to a higher curability of hernia by this method.

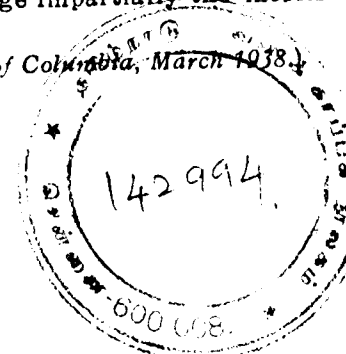
One finds in the recent literature other authors and investigators both approving and disapproving the use of the injection treatment. Those advocating the method, however, outnumber those objecting to its use. Its supporters do not intend that the injection method supplant operation, but reason that it has a definite place in the treatment of hernia. Wangenstein well summarized the situation by saying that medicine has come to recognize the superiority of trial over reason, that prejudices cannot delay the march of progress, and that time will ultimately judge impartially the merits of the injection method of treating hernia.

(Medical Annals of the District of Columbia, March 1938.)

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TUMORS OF THE BLADDER

Benign and Malignant

EDGAR G. BALLENGER, M.D., OMAR F. ELDER, M. D.,
HAROLD P. McDONALD, M.D., R. C. COLEMAN, JR., M. D.
Atlanta

In recent years two factors have assisted greatly in standardizing, at least for us, the management of bladder tumors. They are.

1. Improvement in the equipment for transurethral resection, and fulguration of bladder tumors.
2. Recognition of the advantages of deep x-ray therapy when applied according to the Coutard plan.

It is generally conceded that benign papillomas are likely to undergo malignant degeneration when neglected. Moreover, it is believed that a patient with a benign or a malignant tumor is more likely to develop tumors in new sites than other individuals.

With these two important factors in mind it is obvious that the management of bladder tumors requires more than the mere destruction or removal of the existing tumor. It requires measures to lessen the tendency for further tumor growth. Furthermore, it requires repeated cystoscopic examinations to recognize recurrences *at the site* of the primary tumor or *new growths* which are likely to develop elsewhere in the bladder.

Would not these facts appear to indicate the need of total cystectomy, with transplantation of the ureters into the intestine or externally in the loin or lower abdomen, as the method of choice in dealing with bladder tumors? Such a plan would, of course, be a logical procedure except for the high mortality rate which attends such formidable procedures. Even so, such a plan might seem inevitably indicated if milder measures did not afford reasonably good results, with a much lower immediate mortality rate and amelioration or apparent cures which compare favorably with cystectomy.

Cause of bladder tumors. Except the tumors which are prone to develop in the bladders of aniline dye workers, the cause of benign or malignant vesical tumors is not known. Preexisting chronic inflammation, as first advanced by Billroth, is not supported by facts, nor is the opinion that leukoplakia undergoes malignant degeneration. We are of the opinion that obstructive lesions of the vesical neck and urethra are predisposing factors in the development of bladder tumors. While we have no means of proving this idea it appears to be supported by the fact that among the largest series of cases reported in the literature the preponderant percentage of

bladder cancers of males varies from three to ten times that of females. As is well known, the male is more frequently affected with obstructive lesions than is the female. The small papillomatous growths often seen at the urethro-vesical junction are nearly always present in patients with obstructive lesions of the bladder neck or the urethra. Furthermore, in our own experience, since we have tentatively held this idea, we have found that more than 95 per cent. of bladder tumors have been found associated with definite, although not marked, urethral or bladder neck obstructions. We have not, however, found tumors more prevalent in tight urethral strictures. The tumors have usually been in patients with a moderate degree of obstruction. Whether this observation concerning the incidence of bladder tumors has any significance we do not know. We would greatly appreciate the views of other urologists concerning this point. The idea can soon be disproved if any considerable number of patients with bladder tumors are found free from obstructive lesions of moderate degree.

Diagnosis. Since the treatment of bladder tumors, whether benign or malignant, is so nearly the same the important point is early recognition and destruction of the tumor rather than quibbling over differentiation or the plan of treatment. Certainly it must be admitted that neglected or recurrent benign growths are likely to undergo malignant degeneration. Generally speaking, there is little need to try to make finer differentiation in bladder tumors than to recognize the following.

1. Apparently benign papilloma.
2. Papillary carcinoma.
3. Carcinoma with a more or less broad infiltrating base.
4. Carcinoma which is more like thickening or infiltration, or meaty masses which protrude into the bladder wall.
5. Papilloma which protrudes from the ureter into the bladder.
6. Carcinoma which is an extension from an adjacent structure outside the bladder, such as from the uterus.

It is exceedingly important to note whether tumors are pedunculated or whether they have broad bases and whether single or multiple. The determination of these points plays a considerable part in the prognosis and treatment, and in deciding the frequency of subsequent observations.

As would be expected, recurrences are much more likely when the tumors are multiple than when they are single; single and pedunculated tumors rarely recur.

The main point in the diagnosis of bladder tumors which needs the greatest emphasis, however, is not any of the foregoing points but rather the importance of *early* recognition of bladder tumors. Organized and sustained propaganda to the general practitioner is greatly needed. He first sees these patients and should be repeatedly

and forcibly impressed with the dangers which arise from neglect of painless hematuria, even though slight in amount and appearing only periodically.

Prognosis. The likelihood of cures of bladder tumors varies, as has been indicated already, with the promptness with which they are recognized and with the thoroughness with which they are destroyed. Repeated cystoscopy to detect early recurrences is just as important as early destruction of the primary tumor. Unfortunately bladder tumors at first are painless. If they caused more pain they would not be so frequently neglected. As a rule, metastases do not occur as early as in cancer of the prostate. Naturally they play an important part in the prognosis.

Treatment. As has been implied in the foregoing discussion, tumors of the bladder should be treated early. This can never be accomplished as long as distinct danger signals such as hematuria and persistent cystitis are treated with hemostatic agents or urinary antiseptics, without a correct diagnosis of the causative factor producing the urinary disorder. Enough has not been done by urologists when they devote the major part of their papers to the management of advanced lesions of the bladder. The urologist, who knows better than other practitioners of medicine the vital importance of early diagnosis in the treatment of bladder tumors, should make a constant effort to emphasize the need for determining the cause of hematuria.

Considerable experience with transurethral resection of bladder tumors followed by well screened deep x-ray therapy according to the Coutard plan has convinced us of the value of this plan of treatment for such growths, benign or malignant. Small single papillomas when thoroughly destroyed by fulguration need not be followed by deep x-ray therapy unless they show a tendency to recur. To determine the recurrence promptly, periodic cystoscopy is essential. It is not sufficient to dismiss the patient with instructions to return if blood appears in the urine.

If papillomas are of considerable size, or if they have a fairly broad base or if they are multiple, deep x-ray therapy should be employed regardless of the pathologist's report as to whether specimens removed for tissue study are shown to be benign or malignant.

Since tumors are likely to appear at sites other than that of the original tumor it appears that deep x-ray therapy is preferable to radium because a wider area is subjected to the rays, thus inhibiting the growth of lesions too small for recognition.

The transurethral resection of large tumors of the bladder, using the cutting current through a resectoscope sheath with a shorter projecting beak than that employed for prostatic resection, permits the removal of even large tumor masses, and usually at one sitting. After the mass is resected its base is well coagulated

Except for small papillomas, anesthesia, preferably low spinal, is always employed in order to permit thorough, unhurried removal or destruction of bladder tumors with adequate coagulation of the sites of attachment.

As we look back over our experiences with coagulation of bladder tumors we are impressed with the inadequacy of the early work because we did not then have available the cutting current nor was the anesthesia routinely employed. Most of the time, at best, we had to be content with coagulation of the protruding part of a tumor of any size and not its base.

Postoperative care. One month after the resection of bladder tumors, cystoscopy is done. If only minor abnormalities appear they are coagulated, using local anesthesia. If a mass of any considerable size is seen it is resected as above described, using low spinal anesthesia. X-ray therapy for extensive or multiple benign tumors and for all carcinomas of the bladder is started within a few days after the transurethral resection of these growths. It is given according to the Coutard plan of light, well screened doses every day except Sundays for one month, and sometimes longer. During this time an effort is made to subject the bladder to three thousand to four thousand roentgen units. The dosage, the screening and the frequency of treatments should be regulated so as to avoid bladder or rectal irritation or more than a moderate hyperemia of the skin.

For tumors which protrude from diverticula or from the bladder opening of ureters the above plan is not sufficient. Operative procedures are required in such cases and are carried out according to the indications made evident by a careful interpretation of the cystoscopic study, cystograms, ureterograms, pyelograms, and the general condition of the patient.

How much to resect or fulgurate tumors overlying ureteral openings must be determined by cystoscopic and x-ray studies, not only of the bladder but of both ureters and both kidneys, anatomically as well as functionally.

Time prevents a consideration of the unusual types of tumors of the bladder.

The most unsatisfactory carcinomas to treat are those which are extensive infiltrations of the bladder wall with only slight protruding masses. Equally difficult are the cancers which are extensions from adjacent structures. Their management is naturally dependent upon the character and site of the primary growth.

CONCLUSIONS.

1. Tumors of the bladder should be suspected whenever there is painless recurrent hematuria, even though it is only slight in amount.

2. Benign bladder tumors are likely to undergo malignant change when neglected.

3. Good results cannot be obtained in the treatment of a large percentage of patients with vesical tumors unless an early diagnosis is made.

4. The best means for removal of small tumors is high frequency coagulation.

5. Large tumors, benign or malignant, are removed by the transurethral resection of the masses with the cutting current. The bases of the tumors, so removed, are then coagulated.

6. Deep x-ray therapy according to the Coutard plan is preferable to radium implantation at the sites of carcinomas.

7. Following the destruction of tumors, periodic cystoscopic observation is absolutely essential so that recurrences may be treated early.

(*The Journal of the Medical Association of Georgia, April 1938.*)

Extracts.

PROGRESS IN CHEMOTHERAPY. EDITORIAL.

BRIT. M. J. *London, Feb. 18, 1939, 2: 340.*

The period of nearly 4 years since the public advent of the original prontosil is divisible into three stages: (1) In the first, red prontosil in its two forms was the only therapeutic agent of this kind available; (2) the discovery that this substance breaks down in the body to liberate sulfanilamide, and that the latter, given as such, has a similar therapeutic effect, led to its widespread manufacture under a multitude of proprietary names; (3) prontosil was patented, but sulfanilamide could not be, and the third stage in this history is that in which the research departments of leading manufacturing chemists have been busy synthesizing and testing new sulfonamide compounds with the object of finding one which will be both a boon to humanity and a source of profit because it can be patented.

Although thousands of such compounds have been synthesized, hundreds have been tried experimentally in animals, and a dozen or more have been used clinically, only two appear to call for individual mention—uleron because of its widespread popularity in treating gonorrhea in Germany, and M. & B. 693 for its epoch-making achievement in treating pneumonia.

There is no satisfactory evidence that any of the sulfonamide drugs stimulate the bodily defense mechanism, either cellular or humoral. Likewise, there is no evidence that they act by neutralizing bacterial exotoxins.

There is evidence that the action of these drugs on bacteria in the tissues is a direct one. Two facts in common experience suggest this—(1) the unquestionable antiseptic quality of urine containing sulfanilamide, and (2) the presence of obviously damaged and demonstrably dead bacteria, which have not been phagocytosed, in pus from cases under treatment. It has been found that the bactericidal action of sulfanilamide on streptococci in serum is prevented by the addition of peptone. This observation indicates interference by sulfanilamide with the mechanism whereby streptococci utilize serum proteins as foodstuffs, and that this type of action may be the explanation of the efficacy of the drug. If bacteria are prevented from extracting nutriment from their surroundings, they will die just as surely, although possibly not so quickly, as if they were poisoned by some chemical penetrating them. Even though the bacteria were not killed, cessation of their growth results in almost certain victory for the host, since the unhindered process involves the rapid mobilization of forces on both sides.

If the above explanation is correct, susceptibility to chemotherapeutic attack among different bacteria depends on their type of metabolism. Whatever the truth in this matter may ultimately prove to be, it is reasonable and helpful to assume that the continuous maintenance of a certain concentration of these drugs in the blood and tissues, which can be secured by giving adequate doses at 4-hour intervals, greatly retards or actually prevents further bacterial growth. After a period of this suppression, which in acute infections need rarely exceed a week, the normal defense mechanism can complete the destruction of the invader.

THE TOXIC MANIFESTATIONS OF SULFANILAMIDE AND ITS DERIVATIVES.

PERRIN H. LONG. BULL. GENITOINFECTION DIS., BOSTON.

Feb. 1939, 3: 1.

The most common toxic effects noted following the administration of sulfanilamide or sulfapyridine are anorexia, nausea, vomiting, and dizziness. These symptoms are a result of a direct action of the drugs on the central nervous system. They are generally minimal in patients who are put to bed when the drugs are given. Alcohol aggravates these toxic manifestations and should be forbidden to patients receiving these drugs. Patients receiving sulfanilamide or sulfapyridine should not drive automobiles or do mechanical work because the dizziness resulting from the ingestion of the drug decreases the powers of coordination.

Sulfanilamide rarely affects the peripheral nervous system, although instances of optic neuritis and peripheral neuritis have been reported. Sulfanilyl-sulfanilamide, however, has been known to produce an extensive and prolonged peripheral neuritis. While actual instances of involvement of the peripheral nerves have not been reported as resulting from the use of sulfapyridine, paresthesias and pain in the calves of the leg have been noted in patients under treatment with this drug.

Cyanosis is a very common sign in the course of sulfanilamide therapy, but is not seen frequently when sulfanilyl-sulfanilamide or sulfapyridine is being used. Cyanosis is not due to the presence of sulfhemoglobin, although methemoglobin seems to be a causative factor in certain patients. Administration of methylene blue by mouth is reported to decrease the degree of cyanosis.

Ingestion of sulfanilamide may produce clinical acidosis. Sulfanilyl-sulfanilamide and sulfapyridine apparently do not produce this toxic manifestation. Acidosis can be avoided if 10 to 15 grains of bicarbonate of soda are given with each dose of sulfanilamide.

Fever is one of the most frequent and important signs of toxicity and when it appears, the drug should be discontinued. Sulfanilamide and sulfapyridine have caused serious cases of toxic hepatitis, hence the appearance of jaundice in a patient receiving these drugs is a dangerous sign. Skin rashes are frequent toxic complications. The most common type of eruption is morbilliform, but it may be scarlatiniform, urticarial, erythematous or purpuric in type. The rash may sometimes progress to a severe exfoliating dermatitis. The drug should always be stopped if a dermatitis appears.

Slowly developing hemolytic anemias in which the patient's hemoglobin may drop from 10 to 50 per cent are common in the course of sulfanilamide therapy. Acute hemolytic anemias characterized by a rapid drop in the hemoglobin and total red blood cell count, jaundice, urobilinuria, and leukocytosis sometimes occur. The drug should then be stopped immediately and preparations should be made to transfuse the patient in case such a procedure becomes necessary.

There have been numerous instances of agranulocytosis reported in patients who have received sulfanilamide and in at least one patient receiving sulfapyridine. In these cases, transfusions are probably not beneficial unless the patient's hemoglobin has fallen below 65 per cent.

The treatment of all the toxic manifestations of sulfanilamide therapy consists of first forcing fluids in order to eliminate the drug, and then watchful waiting combined with whatever supportive measures may be indicated in the instance of the individual patient. If severe toxic reactions are to be recognized at their inception, the physician must see his patient daily, and determine the

hemoglobin and total white blood cell count at least every other day. The careless management of patients receiving sulfanilamide or its derivatives is bound to produce an eventual disaster.

THE EFFECT OF COPPER AND IRON UPON THE SECONDARY ANEMIA OF THERAPEUTIC MALARIA IN GENERAL PARESIS.

PURCELL G. SCHUBE AND BLAKE D. PRESCOTT. J. LAB.

AND CLIN. MED., ST. LOUIS. *Jan.* 1939, 24: 346.

A study of the effects of copper and iron on the secondary anemia of therapeutic malaria in general paresis is presented. The results would indicate that these two drugs are of value in lessening the severity and duration of this type of secondary anemia.

It has been shown by work of Hart, Steenbock, Waddell, and Elvehjem that soluble inorganic iron salts in the presence of copper could be used to stimulate the formation of hemoglobin.

Secondary anemias following treatment with malaria for paresis are sometimes alarming in intensity and may persist after the termination of the malaria, irrespective of the institution of iron or liver therapy. The combination of copper with iron was instituted in some of these parietic cases, and, the results being sufficiently promising, it was decided to study the problem carefully. The drugs were administered orally in gelatinous capsules, one three times daily. Each capsule contained 32 mg. of iron and 1.0 mg. of copper.

Eleven adults with varying grades of secondary anemia of unknown origin were given the copper and iron capsules. Eight of this group responded with red blood cell count and increase of from 560,000 to 1,070,000 and increase in hemoglobin of from 10 to 20 per cent over a period of 2 to 14 weeks.

Fourteen adult general paretics were given malaria as a therapeutic measure but were not treated with copper and iron. In this group the hemoglobin reached its lowest point in 4 to 8 weeks after the first temperature elevation. The time required for the hemoglobin to reach a concentration of 80 per cent from the termination of malaria was 4 to 11 weeks. The lowest hemoglobin percentage in these cases ranged from 36 to 58 per cent. The red blood cell count reached its lowest point in 3 to 10 weeks after the first temperature elevation. The time required for the red blood cells to reach their highest concentration from their lowest was 4 to 8 weeks. The lowest red cell concentration in the group was 1.98 to 3.51 millions.

Thirty-one general paretics were inoculated with therapeutic malaria, and iron treatment without copper was started at once. In this group, although ferrous iron was administered regularly from the time of the malaria inoculation until the blood picture returned to normal, the average curves of depression and recuperation of the blood picture were approximately the same as for those receiving no iron.

Thirty-seven adult general paretics were inoculated with therapeutic malaria, and the copper and iron treatment started at once. In this group the hemoglobin reached its lowest point in 1 to 5 weeks after the first temperature elevation. The time required for the hemoglobin to reach a concentration of 80 per cent from the lowest concentration was 0 to 5 weeks. The lowest hemoglobin percentages ranged from 47 to 77 per cent. The red blood cell count reached its lowest point in 1 to 4 weeks after the first temperature elevation. The time required for the red blood cell count to reach its greatest concentration from the termination of the malaria was one to 5 weeks. The lowest red blood cell concentration in the group was 2.5 to 4 million. These findings indicate that administration of copper and iron does stimulate hemoglobin and red blood cell formation.

Medical News and Notes.

THE TINNEVELLY DISTRICT MEDICAL ASSOCIATION, PALAMCOTTAH.

(Tinnevelly Branch of the Indian Medical Association.)

The Tinnevelly District Medical Association held its monthly meeting on the 24th of June 1939, at Papanasam, one of the most sacred places of the District, noted for natural scenery and most charming waterfalls. Members numbering 40 gathered from all parts of the District. All members had an early bath in the Falls which was followed by light refreshments. The Secretary and Treasurer read out the resignation letter from Lt. Col., T. S. Shastri, I.M.S., the former President of the Association, which was accepted. Dr. R. V. Padmanabhan, M.B.B.S., proposed Lt. Col. K.V. Ramana Rao, I.M.S., District Medical Officer, to be the President of the Association and was seconded by Dr. L. Mahadevan, M.B.B.S., D.O.M.S. Lt. Col. K.V. Ramana Rao, I.M.S., was unanimously elected as President of the Association. The Secretary and Treasurer read out the minutes of the last meeting held at Srivaikuntam on the 27th of May 1939.

Dr. K. Rama Ayyar, M.B.B.S., read out the following cases which were successfully operated in the Govt. Hospital, Palamcottah :—

1. A case of Stone in the Bladder.
2. A case of Lipoma right humerus.

Dr. P. Ramalinga Nayanar, of Sherundevi, read an interesting paper on "The Use and Abuse of insulin".

After a detailed discussion by the members, Lt. Col. K.V. Ramana Rao, I.M.S., summed up the salient and important features of all the cases and their differential diagnosis in detail.

Dr. K. Rama Ayyar, M.B.B.S., Secretary and Treasurer, on behalf of the Association, offered his cordial thanks to Dr. T. V. Gopala Menon, M.B.B.S., for the excellent arrangements.

Thereafter a Dinner brought the happy gathering to a close.

THE KRISHNA DISTRICT MEDICAL ASSOCIATION.

(Krishna District Branch of the I. M. A.)

The Second monthly meeting of this Re-modelled Association was held at the District Medical Officer's Bungalow, Masulipatam on 12th June. 42 members of the Association, including 5 women members, came from many parts of the District. 10 new members were enrolled at the meeting. The total strength is now 95.

The meeting was presided over by Lt. Col. T. S. Shastri, I.M.S., District Medical Officer Krishna, the President of the Krishna District Medical Association. After tea and music the meeting began with a welcome speech from the President.

The Secretary read the minutes of the last meeting, held at Bezvada on 13th May. Two members were elected to the Central Council at Calcutta ;—(1) Lt. Col. T. S. Shastri, I. M. S. (President), (2) Dr. M. Seshacharyulu, L. M. & S. (Vice-President.)

The Clinical Meeting:—Dr. K. V. Subba Rao, L.M.P., The Secretary of the Association read case-notes on (1) Gas-Gangrene, (2) Osteomyelitis, (3) Appendicular-Abscess, (4) Rupture of Urethra, (5) Sub-Acute Intestinal Obstruction. Dr. Miss. J. Neelamma, L.M.P. Masulipatam, read case-notes on, (1) Placenta Praevia (2) Cancer of Cervix (3) Accidental Hemorrhage. Dr. S. Gopalakrishnamurthi, Kankipadu read case notes on (1) Tracoma.

Altogether 57 members were enlisted for the I.M.A.

The President explained in detail the differential diagnosis and treatment of all the cases and exhorted the members to give their best to their professional work and to the Association and hoped that all those who are eligible will join the Association very soon and set a high example to the rest of the Andhra Desa. The President then thanked all those who paid up their dues. The Collector of Krishna District, was pleased to attend the meeting.

Review.

Mr. A. T. Paul of the Rosbay Clinic, 271 Chittaranjan Avenue (north), Calcutta, has found a new treatment for filariasis. The treatment is either oral or by injections. The treatment is of great value for patients suffering from elephantiasis, lymph scrotum, chyluria, filarial fever etc. The preparation does not contain antimony, arsenic or any vaccine except Tr. Rosbay and a rare element (radio-activity) and is absolutely harmless. The treatment consists of injections of graduated doses of extract of the drug (Rosbay) in three courses. Each course consists of six graduated doses, given subcutaneously at intervals of 3 to 30 days. The oral treatment is not so prompt as by injection. Many prominent doctors all over India have used this specific for patients suffering from the dreadful disease, filariasis, and claim very successful results even in long standing cases. The cost of the treatment is not very much considering the inconvenience caused to the patient and is within the limits of every one. So I request medical men to give a fair trial to the preparation in their practice and give relief for the sufferers of filariasis.

TREATMENT OF CORNEAL OPACITY BY "OPACITINE"

We received a Phial of "Opacitine" (Regd.) from Messrs. S. Krishna Research Laboratories (Regd.), 103, Railway Road, Pasrur. Dist. Sialkote (Pb) and gave a fair trial to it on a member of our staff. We found it very usefull and efficacious on any kind of Corneal Opacity, may it be a Nabula, a Macula or even a Leucoma of any size, shape and duration what-so-ever. We can assure the Physicians, Surgeons and Eye Specialists that "Opacitine" (Regd.) had a marvellous action to remedy the Leucoma of about nineteen years' standing and it totally vanished by the use of this Specific within a month's time. Really it is a "Miracle" in the Modern Medical Science and is the research of about 30 years experience of Dr. S. K. Gupta B.D.Sc., B.O. (Pb).

"Opacitine" (Regd.) has quite harmless qualities to cure Cataract, Belptherities, Pterygium and Chronic Trachoma too. Its course of treatment is from 2 weeks to 6 weeks as the case may be. It is of a high standard medicine and can stand a comparison to any other

high standard patent medicine of England and on the continent. The price of this Specific is far cheaper as compared to its marvellous action and speedy curative properties on any kind of Corneal Opacity than any other of the foreign medicines.

The management gives full gaurantee for their Specific the "Opacitine" (Regd.) on the understanding that in case of non-efficiency for any reason what-so-ever, full price will be refunded.

We are very glad to note that India can prepare such "Specifics" for respective maladies to a standard equal and even higher to foriegn patent medicines.

We heartily congratulate the inventor of "Opacitine" (Regd.) Dr. S. K. Gupta for his sincere and valuable research and wish him every success and prosperity.

We further appeal to the Physicians, Surgeons and Eye Specialists in particular and to the Medical Profession in general to encourage the above Indian Institution by sending their valued orders in heavy numbers for "Opacitine" (Regd.). A fair trial will convince them before tatooing or operative treatment is resorted to.

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