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2. Experiments show that the true systolic and diastolic blood pressures are not very different from those recorded by the auscultatory method.

3. Simultaneous recordings of arterial pressure in the axillary, femoral and dorsalis pedis arteries show that the latter two exceed the former by such figures as 20 and 55 mm. of mercury respectively, systolic. Diastolic pressures are nearly equal.

4. Simultaneous records of arterial and intrathoracic pressure show that the intrathoracic and probably the intra-abdominal arteries are protected from the large pressure fluctuations which coughing and straining produce in the systemic blood pressure.

5. Similar changes occur in the spinal pressure during straining and coughing which protect the arterial tree within the craniospinal canal from these unusual stresses. Thus a simultaneous sudden rise of arterial and spinal pressure of 100 mm. of mercury resulting from severe coughing leaves the net intraspinal arterial pressure unaffected.

ABSTRACT OF DISCUSSION

DR. RALPH H. MAJOR, Kansas City, Mo.: My observations, using the apparatus supplied me by Drs. Hamilton and Woodbury, have been limited to experimental animals. As clinicians we can derive satisfaction from the observation that, checked by this accurate method, our ordinary methods of taking the blood pressure of patients are quite satisfactory. This method, however, in the study of problems connected with hypertension or with disturbances of circulation, does many things that the ordinary blood pressure equipment does not. One of the most interesting features of this apparatus is the fact that it enables one to get away from the inertia of mercury. I have been astounded to see the terrific elevations of blood pressure that follow the administration of pressor substances. These elevations of blood pressure cannot be taken with a mercury manometer, since the mercury has too much inertia to follow these quick changes in pressure. For instance, I have seen systolic pressures as high as 400 mm. and diastolic pressures as high as 300. It is possible to demonstrate these very rapid changes only with such an apparatus. Since seeing some of these tracings in animals and a few that Dr. Woodbury has shown me on patients, I feel a little more respect for such substances as epinephrine. The authors didn't have time to bring that out in their paper, but I am sure we would be interested to have him refer to that in his closing discussion. Another interesting feature of his paper has been the demonstration of the effect of coughing on the coronary circulation. I wonder just what happens to the coronary circulation of a patient who has pneumonia and coughs continually. It makes one wonder if perhaps we shouldn't take the heart a little more into account than we seem to be doing at the present time. This new method of estimating the blood pressure opens new fields for exploration. Much of the work that has been done on blood pressure in anesthetized animals must be revised in the light of methods that estimate the pressure of patients and animals without the administration of drugs.

DR. R. A. WOODBURY, Augusta, Ga.: We have modified our cannulas so that we have a special type which enabled us to follow blood pressure changes in small animals, such as rats and mice. This will allow experimental workers to follow blood pressure changes in these animals, obtaining systolic and diastolic pressures, for a long period without sacrificing the animal. This technic will be described elsewhere. We hope to continue this work in the field of drug studies both in animals and in man. Preliminary work with epinephrine on human beings has shown some very striking blood pressure changes. The first patient receiving epinephrine had asthma. He was given a fairly large injection, 0.45 cc. of 1:1,000, not any larger than is given every day in outpatient clinics or in the emergency room. The pressure of this individual became elevated to such a height that we were not able to get the record. I know it went over 380, because we could have followed any changes to 380 mm. of mercury. We have studied

the effect of smaller doses since that time and observed very definite periods of arrhythmia as a result of epinephrine. We hope to continue our studies on other cardiovascular drugs in animals and human beings. Another field which we expect to study is the strains that occur during parturition. We have noticed that the longer the strain the bigger the rise following the release of the strain. We expect to find some interesting changes following parturition pain and the strain that accompanies it.

UNTREATED SYPHILIS IN THE MALE NEGRO

A COMPARATIVE STUDY OF TREATED AND UNTREATED CASES

R. A. VONDERLEHR, M.D.

TALIAFERRO CLARK, M.D.

O. C. WENGER, M.D.

AND

J. R. HELLER JR., M.D.

Assistant Surgeon General, Medical Director (Retired), Surgeon, and Assistant Surgeon, Respectively, United States Public Health Service
WASHINGTON, D. C.

A determination of the effectiveness of treatment in preventing the transmission of syphilis is one of the basic problems in the control of this disease. Second in importance to it is the effect which treatment has in preventing late and crippling manifestations. The administration of adequate treatment in early syphilis is recognized as the most important factor in the prevention both of communicable relapse and of the early complications so detrimental to the health of the individual patient. As the result of surveys of a few years ago in southern rural areas it was learned that a considerable portion of the infected Negro population remained untreated during the entire course of syphilis. Such individuals seemed to offer an unusual opportunity to study the untreated syphilitic patient from the beginning of the disease to the death of the infected person. An opportunity was also offered to compare this process, uninfluenced by modern treatment, with the results attained when treatment has been applied.

The material included in this study consists of 399 syphilitic Negro males who had never received treatment, 201 presumably nonsyphilitic Negro males, and approximately 275 male Negroes who had been given treatment during the first two years of the syphilitic process. All these individuals were more than 25 years of age. The percentage of persons in each age group is comparable. The method of case finding and study has as far as possible been comparable and nonselective. The patients with untreated syphilis and presumably nonsyphilitic individuals were chosen primarily by the use of the Kolmer complement fixation and the Kahn standard flocculation tests for syphilis and subsequently by the presence or absence in the history of the early manifestations of syphilis. A total of 1,782 male Negroes aged 25 years or more were serologically examined in a rural county. Of these, 472 gave at least two positive serologic tests for syphilis. From this group the 399 patients with untreated syphilis were taken for this study. Only individuals giving a history of infec-

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The authors are indebted for cooperation and assistance in conducting this study to the personnel of the John A. Andrew Memorial Hospital, Tuskegee Institute, Ala., the U. S. Veterans Administration Facility, Tuskegee, Ala., the Macon County Health Department, Tuskegee, Ala., and the State Department of Health, Montgomery, Ala.

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tion who submitted voluntarily to examination were included among the 399 patients. Of the total 1,782 Negro males, 1,258 were found to be serologically negative for syphilis. Persons in age groups comparable to the untreated syphilis cases were taken from these 1,258 serologically negative individuals, provided a subsequent serologic study gave no evidence of syphilis and a history of infection was absent.

The examinations included a careful history, a detailed physical examination, routine teleroentgenologic study of the heart and great vessels in the anteroposterior position, roentgenologic study of the osseous system if indicated, and a spinal fluid examination in 271 of the 399 patients with untreated syphilis. The routine examinations were performed by physicians trained in clinical syphilology. The assistance of specialists was utilized when manifestations were such as to require unusual examinations.

The case records of patients with syphilis who received varying amounts of treatment during the first two years of their disease were available for this study. These case records were from the syphilis clinics of five universities which have undertaken retrospective clinical studies under the guidance of the Public Health Service. Roentgenologic study of the chest was not routine in this group, although such studies were made when indicated. The spinal fluid was examined in a larger percentage of the untreated syphilitic patients than in the treated syphilitic group.

The present study presents the physical and mental condition of a cross-section of the untreated seropositive syphilitic male Negro population. The problem offered by those individuals who had been infected with syphilis but who had spontaneously become serologically negative will not be discussed here. No data are available that indicate the frequency with which negative serologic tests spontaneously develop in the Negro with latent or late syphilis. Reports from the current medical literature indicate that approximately 75 per cent of patients with active late syphilis have positive serologic tests, regardless of whether or not they received previous treatment. In the recent studies¹ of the Committee on Evaluation of Serodiagnostic Tests for Syphilis, 3,961 specimens from 307 patients with latent and late syphilis were examined by thirteen participating serologists. Most of these patients had received varying amounts of treatment; a few were untreated. Among the 3,961 specimens examined, 2,976, or 75.1 per cent, were positive. The present study, therefore, represents the condition of at least three fourths of the untreated syphilitic Negro population.

MORBIDITY IN UNTREATED SYPHILIS

A comparison of the physical and mental condition of the untreated syphilitic patients with the apparently nonsyphilitic Negroes in the general population permits an estimate of the effect of syphilis in the production of morbid processes involving the various systems of the body. Only 16 per cent of the 399 untreated syphilis patients gave no evidence of morbidity, as compared to 61 per cent of the 201 presumably nonsyphilitic Negroes. The effect of syphilis in producing disability in the early years of adult life is to be noted by comparing the cases with no demonstrable morbidity under 40 years of age. This comparison shows that only

¹ Cumming, H. S., and others: The Evaluation of Serodiagnostic Tests for Syphilis in the United States: Report of Results, Ven. Dis. Inf. 18: 189 (June) 1935; J. A. M. A. 101: 2082 (June 8) 1935.

one fourth of the Negroes with untreated syphilis had no manifestations of disease, whereas three fourths of the uninfected population were free.

With an increase in age there is, as one would expect, an increase in the frequency of manifestations of cardiovascular involvement due not only to syphilis but also to arteriosclerosis and hypertension. Modern diagnostic methods have not as yet progressed to such an extent that most signs and symptoms of cardiovascular disease are recognized as pathognomonic on an etiologic basis. This is especially true for the earlier manifestations of disease involving this system of the body. The manifestations of aortitis here recognized were those which have been generally accepted as diagnostic for several decades, as well as those which have more recently been emphasized by Carter and Baker² and Moore, Danglade and Reisinger.³ Roentgenologic manifestations of increased aortic width and the presence of two of the remaining six signs of these investigators were considered to be diagnostic evidence of

TABLE 1.—Comparison of Results of Physical Examination of Untreated Syphilitic and Presumably Nonsyphilitic Male Negroes in Similar Age Groups

Type of Abnormality Found	Age of Patients at Time of Examination					
	Syphilitic	Nonsyphilitic		Syphilitic	Nonsyphilitic	
	25-39	40 and Over	Total	25-39	40 and Over	Total
Diseases of circulatory system:						
Definite cardiovascular disease	25.3	63.1	46.6	5.7	37.7	23.9
x-ray evidence alone or incomplete clinical evidence of uncomplicated aortitis.....	30.5	18.2	23.6	7.0	3.5	5.0
Diseases of:						
Central nervous system.....	23.0	28.4	26.1	1.1	3.5	2.5
Skin and adnexa.....	12.6	22.7	18.3	2.3	7.9	5.5
Bones, joints and bursae.....	12.1	12.9	12.5	4.6	4.4	4.5
Respiratory system.....	1.1	2.2	1.8	2.3	6.1	4.5
Genito-urinary system.....	4.0	2.7	3.3	2.3	...	1.0
Eye and adnexa.....	0.6	3.1	2.0	...	1.8	1.0
Ear, nose and throat.....	4.6	0.9	2.5	...	0.9	0.5
Digestive tract.....	0.6	0.4	0.5	...	0.9	0.5
Cases with no morbidity.....	25.3	8.4	15.8	77.0	49.1	61.2
Total cases: Number.....	174	225	399	87	114	201
Per cent.....	100.0	100.0	100.0	100.0	100.0	100.0

aortitis. The roentgenologic readings were based on the interpretation of observations as outlined by Vaquez and Bordet.⁴

Study of the untreated syphilitic and presumably non-syphilitic individuals under the age of 40 years indicates that syphilis in this period tends greatly to increase the frequency of manifestations of cardiovascular disease. It is to be noted that of 174 syphilitic individuals under 40 years, 25.3 per cent had definite manifestations of cardiovascular disease, as compared with 5.7 per cent of eighty-seven individuals in the same age group who were nonsyphilitic. A difference may still be noted in individuals over the age of 40, although this difference is not so pronounced. Of 225 untreated syphilitic patients over 40 years of age, 63.1 per cent had definite manifestations of cardiovascular disease as compared with 37.7 per cent among 114 nonsyphilitic individuals.

Perhaps the most interesting group of patients in the study, because of their potential amenability to treatment, are those who have presumptive evidence of uncomplicated aortitis. Because of the strictness of present-day criteria, these cases could not be definitely

² Carter, E. P., and Baker, B. M., Jr.: Certain Aspects of Syphilitic Cardiac Disease, Bull. Johns Hopkins Hosp. 48: 315 (May) 1931.

³ Moore, J. E.; Danglade, J. H., and Reisinger, J. C.: Treatment of Cardiovascular Syphilis, Arch. Int. Med. 49: 879-924 (June) 1932.

⁴ Vaquez, H., and Bordet, E.: The Heart and the Aorta, New Haven, Conn., Yale University Press, 1920.

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diagnosed. Of the untreated syphilitic patients, 23.6 per cent had presumptive evidence of uncomplicated aortitis, while only 5 per cent of the nonsyphilitic patients presented such evidence. In the early years of adult life, especially among untreated syphilitic patients, it is more common to have either roentgenologic or clinical evidence of increased aortic width alone than it is to have a combination of the two. In later years, however, the corroborative evidence more frequently permits a definite diagnosis of uncomplicated aortitis. This fact is so striking that presumptive evidence of aortitis should be regarded as of great importance and patients giving such evidence should be subjected to long periods of observation and treatment. The exact interpretation of these manifestations awaits more definite proof, which it is hoped may be accumulated by following the untreated syphilitic individuals over a period of years, a number being ultimately brought to autopsy. Such an attempt is now being made with the assistance of a philanthropic organization. The purpose is to confirm

tations that were common included positive reactions in the spinal fluid, and changes in the pupillary reactions and tendon reflexes. No typical cases of dementia paralytica or tabes dorsalis were noted but one case of simple dementia was found. In order to be certain that there was no selection of patients through loss to institutions for the insane, it was learned that not a single male Negro over 25 years of age was confined with syphilis of the central nervous system in the Searcy Hospital at Mount Vernon, Ala., where the Negro insane in this state are hospitalized.

In the group of 399 untreated patients with syphilis, forty-six (11.5 per cent) gave evidence of late involvement of the bones, joints and skin. Of these, thirty-six patients (9 per cent) showed periostitis, osteitis or Charcot's joints. Two patients, or less than 1 per cent, presented late syphilis of the skin, and eight (2 per cent) had both a late skin and a bone or joint involvement.

EFFECT OF TREATMENT

All syphilologists recognize the great importance of the provision of treatment during the first two years of the syphilitic process, and all are likewise of the opinion that treatment during this period should be adequate. An accurate evaluation of the modern treatment of syphilis is, however, made difficult by many factors. First of all, adequate treatment has not been freely available to most indigent citizens for a period longer than a decade. Furthermore, not until about twenty years ago was the administration of the arsphenamines started in this country on a large scale. In comparing the results obtained by modern treatment with those in untreated patients, it is important that both groups be observed for a definite period. An observation period of at least twenty or more years is necessary to give a true picture of the value of therapy. The incompleteness of records of patients treated in the past often does not permit such a comparison. Final evaluation of treatment must await the accumulation of well kept records of patients treated and observed over a sufficiently long period.

In connection with the administration of adequate treatment, the tendency of all patients, whether white or colored, is to become dilatory in returning to the attending physician during the observation period. If the individual remains symptom free and the physician has assured him that adequate treatment has been administered, repeated return for observation soon becomes irksome. The consequent lapse tends to distort the results obtained with adequate treatment, since patients who suffer no relapse fail to return, while those presenting intractable manifestations are prone to return for long continued treatment.

In the following discussion more than twenty doses of an arsphenamine with an accompanying heavy metal preparation are arbitrarily classified as minimum adequate treatment. Less than this amount has been called inadequate. Among sixty-eight individuals who were adequately treated during the first two years of their infection, not a single one returned with any of the manifestations of late syphilis. The fact that none of these patients returned up to the fifteenth year of observation with a late syphilitic manifestation indicates that effective treatment has definite preventive value against the crippling manifestations of late syphilis. The degree of protection is even more manifest if a comparison is made with the patients with untreated syphilis during comparable periods.

TABLE 2.—Comparison of Results of Examination of Untreated Syphilitic Male Negroes 25 or More Years of Age, with Those in a Similar Group of Treated Syphilitic Patients Showing Duration of Infection

Treatment	Type of Manifestation	Duration of Infection in Years		
		Three	Six	Nine
None.....	Cardiovascular.....	7.7	12.0	41.9
	Neurosyphilis.....	30.8	36.0	29.0
	Asymptomatic.....	15.4	20.0	12.9
	Symptomatic.....	15.4	16.0	16.1
	Total cases: Number....	26	25	31
Inadequately treated during first two years of infection	Cardiovascular.....	1.2	6.1	6.9
	Neurosyphilis.....	9.3	18.4	13.8
	Asymptomatic.....	2.3	6.1	3.5
	Symptomatic.....	7.0	12.3	10.3
	Total cases: Number....	86	49	29
	Per cent....	100.0	100.0	100.0

the presumptive manifestations of cardiovascular disease if possible and to corroborate the accuracy of clinical observations in general.

The incidence and character of syphilis of the central nervous system in the Negro has been a controversial issue for many years. Generally speaking, one group of observers believes that dementia paralytica and tabes dorsalis are not particularly common in the Negro race. A second group is of the opinion that parenchymatous neurosyphilis occurs almost as frequently as in the white race. In this study 26.1 per cent of 399 untreated syphilitic Negro males had either clinical or serologic evidence of central nervous system involvement. Only 2.5 per cent of the 201 nonsyphilitic Negroes, on the other hand, had any disease of the central nervous system.

Analyzing our data further, we find that of the 399 untreated syphilitic patients 7.8 per cent had definite clinical evidence of central nervous system syphilis, while in an additional 18.3 per cent the diagnosis of central nervous system involvement was based on serologic evidence only. The untreated syphilitic patients included 3 per cent of a relatively benign parenchymatous type and 4.8 per cent with all other forms of central nervous system involvement. In the latter group the most serious type was the vascular form.

With regard to the benign parenchymatous type, such patients did not appear to run the usual classic course of dementia paralytica or tabes dorsalis. The manifes-

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Table 2 permits a comparison, at intervals of three, six and nine years after the syphilitic infection began, between untreated patients and those receiving inadequate treatment. Among eighty-six inadequately treated male Negroes whose infection was of three years' duration, as compared with twenty-six untreated patients in the same chronological period, 1.2 per cent of the former had evidence of a cardiovascular involvement as compared to 7.7 per cent of the latter. Syphilis of the central nervous system was present in 9.3 per cent of the inadequately treated patients in this period, as compared with 30.8 per cent of the untreated individuals. The preponderance of the late manifestations of syphilis in the untreated patients as compared with the inadequately treated continues throughout the years of observation. Nine years after the onset of the syphilitic infection, the inadequately treated patients had 6.9 per cent cardiovascular involvement and 13.8 per cent central nervous system involvement, as contrasted with 41.9 per cent and 29.0 per cent respectively among the untreated syphilitic Negro males.

CONCLUSIONS

1. The clinical and laboratory observations in 399 adult male Negroes with untreated syphilis and 201 presumably nonsyphilitic adult male Negroes in comparable age groups permit a comparative determination of the extent of morbidity due to untreated late syphilis.

2. The results indicate that the cardiovascular system is the most commonly involved in the late syphilitic process and the aorta is the most commonly involved structure in so-called latent syphilis in the adult male Negro.

3. Morbidity in the male Negroes with untreated syphilis far exceeds that in a comparable presumably nonsyphilitic group.

4. Adequate antisyphtilic treatment prevented all forms of clinical relapse during the first fifteen years of the infection, whereas only one fourth of the Negroes with untreated syphilis were normal.

5. Cardiovascular and central nervous system involvements were from two to three times as common in the untreated syphilis group as in a comparable group receiving even inadequate treatment.

ABSTRACT OF DISCUSSION

DR. CHARLES C. DENNIE, Kansas City, Mo.: Dr. Vonderlehr and his co-authors have some ideas concerning the involvement of the central nervous system in Negroes. It is a great deal higher than we have been led to expect. Central nervous system syphilis in the colored races is somewhat lower than it is in the white. It is believed by many authorities that the presence of malaria in countries inhabited by the colored or the Indian race is responsible for the comparative absence of central nervous system involvement. The second school states that it is the comparative resistance of the central nervous system to syphilis in the colored races that is responsible for the smaller number of involvements. It is known from the work of Peterson that the Negro who migrates to the North develops more tabes dorsalis and dementia paralytica; likewise that in the northern countries with a large Negro population, such as in Kansas City, with 50,000 Negroes, that there is a comparatively small number with involvement of the central nervous system. In Kansas City at present and for many years there has been practically no malaria, so that malaria as an influence cannot be considered. From observation in other places it must be concluded that the color of the skin has some effect on the smaller number of central nervous system involvements. I have observed in Brazil, during a short stay, not only the incidence of syphilis but also the incidence of malaria. The hydro-electric plant built for the city of São Paulo, a city

of some 1,200,000, one of the largest municipal hydro-electric plants in the world, was constructed in the midst of a malaria infested district. In an examination of 25,000 applicants for jobs on the construction only 8,000 were free from malaria. This figure may be taken as a fair indication that 75 per cent of the population are suffering from either chronic or acute malaria. It is stated by the Brazilian authorities that the incidence of syphilis in the city of Rio de Janeiro is about 35 per cent. The incidence of dementia paralytica and tabes dorsalis, however, is much lower than it is among the more northern countries. It must therefore be assumed that the comparative freedom of the colored races from central nervous system syphilis is due to two causes: first, a racial influence that modifies the action of the organism of syphilis on the central nervous system, a lessened threshold value for symptoms even where they do have the asymptomatic symptoms of the central nervous system, and, second, the presence of malaria in a comparatively large percentage of the population.

DR. HARRY M. ROBINSON, Baltimore: After all these years, since 1905, when progress in the knowledge of syphilis really started or was awakened, it is surprising to find how ignorant the average medical man is of the treatment of syphilis. Of course, in every large clinic these figures which Dr. Vonderlehr and his co-workers have shown are known; they vary somewhat in the various clinics; we see probably a few more patients with dementia paralytica, still more optic atrophies in the Negroes than others have reported, but nevertheless the important thing is that we have noted the fact that syphilis is not merely a chancre and consequent secondary skin lesions, but a ravaging disease which destroys the organs of the body. It is a pity that not more emphasis is laid on this fact, because in visiting smaller towns I am struck with the fact that much ignorance is displayed on syphilitotherapy. Many students write us that the competition in their communities is too great for them to insist on our outlined course of treatment. The average physician in their community advises a course of seven to ten injections of arsphenamine or a bismuth compound as a complete treatment for syphilis.

DR. ARTHUR SCHOCH, Dallas, Texas: It is gratifying to get some accurate figures with regard to the incidence of syphilis. It seems that most of these studies must originate in governmental departments rather than private clinics. In Dallas we have recently done a study in an attempt to find out the incidence of syphilis in the outpatient clinic at Baylor Hospital. We purposely selected the year of 1934 to go through 3,300 records, because during that year our clientele at the clinic was recruited from a slightly higher social level than usual. The general incidence of syphilis in the outpatient department was 17 per cent. The incidence in white patients was 9 per cent, in colored patients it was 31 per cent. We then subdivided these patients, trying to ascertain the approximate incidence of syphilis coming from the various departments, such as medicine, surgery, obstetrics and gynecology. Taking the department of medicine as a base line, we found that the incidence of syphilis coming in through the medical department in white patients was 12 per cent. We then compared the incidence of syphilis coming from the various specialties. Obstetrics gave the lowest percentage, 2. Interestingly enough, such narrow specialties as ophthalmology and otolaryngology showed an incidence of 8 per cent, as compared to 12 from internal medicine, only 1 per cent less of the general incidence of syphilis of all white patients who came to the outpatient department for various reasons.

DR. JAMES K. HOWLES, New Orleans: Several years ago a neurologist presented at a meeting in Kansas City a case of dementia paralytica in a Negro. I was surprised to find at New Orleans a clinic that was treating an enormous group of patients. We treat an average of 1,300 to 1,800 syphilitic patients a week in the antisyphtilic clinics of Charity Hospital, which gives an idea of how many colored patients we see. We are trying to systematize the treatment and the investigation so that our records will mean something. But the point I wish to stress is that central nervous system syphilis isn't rare in the colored; in fact, it is almost as prevalent in our clinics as in the white, but of course our white cases are far in the minority as compared with the colored cases. We have investigated why there

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are so many complaints of a cardiovascular nature in the colored people. In analyzing some 1,400 cases with an internist, I find that the symptoms they give relative to cardiovascular syphilis vary so much that they have to be greatly discounted in the cases of the colored females. In analyzing some 1,400 cases and examining them thoroughly, with the aid of electrocardiograms and roentgenograms of the chest, we found that most of the complaints in the colored female are groundless, whereas the complaints in the colored males are not stressed enough. I bring up these two points to show that there is a lot to be learned in the classification of syphilis in the colored, and I believe that with such studies as the author has presented, in the course of a few years we shall be able to get somewhere.

DR. R. A. VONDERLEHR, Washington, D. C.: I wish to assure Dr. Howles that we had considerable difficulty in taking the histories of syphilitic Negro males. The average Negro is a most congenial person and he has a tendency to agree with almost anything that one wishes him to agree with. We spent an hour or more getting each one of these histories. Dr. Dennis brought up the question of the influence of malaria on the incidence of central nervous system syphilis. We inquired from each of these Negroes whether he had ever had malaria or typhoid. I believe around 25 or 30 per cent of the Negroes reported that they had had one or the other of these diseases. We have available this analysis, which we expect to report ultimately in a more detailed paper on syphilis of the central nervous system in the Negro. The incidence of syphilis was not more frequent in the group which had never been infected with either malaria or typhoid; in other words, there was no difference in the two groups after breaking down our figures.

Clinical Notes, Suggestions and New Instruments

A SUBTROCHANTERIC OSTEOTOMY

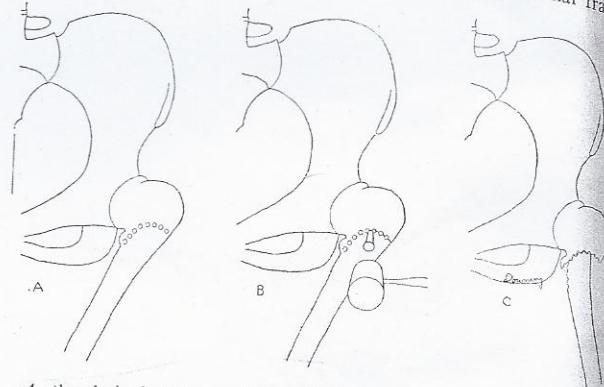
F. HAROLD DOWNING, M.D., AND ROBERT H. MORRIS, M.D.
BOSTON

Subtrochanteric osteotomy of the femur for flexion adduction deformity of an ankylosed hip is a common and widely used corrective operative procedure. It has been our experience that most methods commonly in use do not allow accurate control of the distal fragment. It is not uncommon for this fragment to slip following osteotomy during correction of the deformity and override the proximal fragment. This has also been known to occur during closure of the wound and even several days after operation even though a hip spica was used for fixation. Usually the affected leg is already too short and the additional shortening is anything but desirable. It is likewise not unusual to find on removal of the spica that there has been a gradual loss of the correction of abduction. When the extremity is placed in the abducted position it causes considerable tension on the adductors, which have become shortened from contracture by adaptation to the adducted position. This constant tension has a tendency to rotate the pelvis within the spica and thus minimize the correction. It is our intention to report a method which, although both simple and easy, completely overcomes these difficulties.

Due credit must be given to Brackett for introducing the curved subtrochanteric osteotomy, which was designed to allow the distal fragment to rotate on the concave proximal end, thus allowing the distal fragment to be rotated without danger of slipping. However, in performing a curved osteotomy with an osteotome alone there is always danger of a breaking off of the important medial tip of the proximal fragment which is extremely necessary. It is this portion which prevents the distal fragment from dislocating medially. By outlining the desired curve first with a series of one-fourth inch drill holes one-fourth inch apart (*A* in illustration) and using an osteotome only for cutting the bone left between (*B*) it is possible to control accurately the exact place, curve and angle of the

The use of drill holes for outlining the location for an osteotomy was first learned indirectly by one of the authors through Dr. J. K. Adams, but we have recently discovered that a procedure closely resembling the one described has been used at the Massachusetts General Hospital. No published account could be found.

osteotomy. When the osteotomy has been completed, one finds that the opposing surfaces resemble those of opposing gears and it is very easy to rotate the distal fragment into any desired position. One is sure of accurate fixation, for the "cogs" fit into each other in the new position (*C*) and prevent any immediate or future danger of slipping, thus avoiding overriding or rotation of the pelvis with the resultant loss of correction. We have found it best to make the proximal frag-



A, the desired curve is first outlined with a series of one-fourth inch drill holes one fourth inch apart. *B*, the intervening bone is cut with a half inch osteotome. *C*, the distal fragment is rotated on the concave proximal fragment till the desired correction is obtained.

ment as short as safely possible and plan to have the curve extend from the region of the lesser trochanter upward and outward to just below the greater trochanter. The operation is then performed chiefly in very vascular cancellous bone and union is very rapid. A hip spica is used for fixation, the plaster extending from the toes of the operated leg to the middle of the thorax.

REPORT OF CASE

A woman, aged 46, admitted to Brooks Hospital Oct. 7, 1935, with a diagnosis of an old healed tuberculosis of the left hip, left knee and spine, had 4½ inches shortening of the left leg. The left hip was ankylosed in 40 degrees flexion and 40 degrees adduction.

October 9, under general anesthesia, a 6 inch longitudinal incision was made on the anterior lateral aspect of the left thigh just below the region of the greater trochanter. The soft tissues were divided in the same plane and the region of the femur exposed extending from the lesser trochanter to just below the greater trochanter. A series of one-fourth inch drill holes one-fourth inch apart was then made in a curve from the lesser trochanter upward and outward to just below the greater trochanter, the drill being directed posteriorly and slightly upward. The intervening bone was cut with a half inch osteotome, the instrument being directed in the same plane. On completion of the osteotomy, the leg was rotated into 15 degrees abduction and full extension. The wound was then closed in layers and a single hip spica applied. The post-operative convalescence was uneventful. The spica was removed in ten weeks but the patient was allowed to remain in bed for another four weeks before being allowed up on crutches. By the end of six months, union was firm and full weight bearing was painless. The correction had not changed.

COMMENT

We have reported and described an operation for flexion adduction deformity of an ankylosed hip which we believe to be much better than those in common use for the following reasons:

1. It is simple and easy to perform.
2. The location, extent and angle of the bone fracture can be accurately controlled.
3. There is no danger of unforeseen fracture.
4. One has perfect control of both fragments during the entire operative procedure.
5. Fixation is easy, with no immediate or future danger of slipping.
6. The callus is abundant and union is rapid.
7. There is little or no operative shock, and the postoperative convalescence should be uneventful.