

PREOPERATIVE HEMO-IRRADIATIONS

LIEUT. COMDR. E. W. REBBECK, M.C. (U.S.N.R.)

PITTSBURGH, PENNSYLVANIA

PREOPERATIVE protection by the Knott technic of ultraviolet blood irradiation therapy has been studied for the past five years at Shadyside Hospital in Pittsburgh. Since 1937, approximately 4,500 ultraviolet blood irradiations have been administered to about 1,500 patients. Those cases in which this therapy was administered preoperatively followed a subsequent postoperative course that merited a detailed study of its use as a protective preoperative measure.

This therapy has been used for the successful treatment of different types of septicemias as reported by Hancock and Knott,¹ Barrett,² Miley,⁷ Rebbeck,³⁻⁶ Miley and Rebbeck,⁸ and Hancock.⁹ The rationale of ultraviolet blood irradiation therapy and the known reactions taking place following administration in cases of septicemia indicated it should prevent the development of septicemia. Further the known reactions and rationale indicated that definite protection should be afforded the patient against postoperative reactions when the operative risk is of questionable nature.

The primary field of clinical investigations was that of incomplete septic abortion as reported by the author. This paper described a radical and successful treatment consisting of preoperative ultraviolet blood irradiation therapy followed by dilatation and curettage, using a sharp curet as in clean cases. Our experiences in other pathological conditions show that ultraviolet blood irradiation therapy used preoperatively is a safe procedure, permitting radical and advantageous departure from conventional treatment of at least the following diseases and in the following manner:

1. *Acute Rheumatic Fever and Rheumatic Arthritis.* Tonsillectomy and adenoidec-

tomy as well as teeth extractions in the early acute febrile stage.

2. *Multiple teeth extractions* in bad risks from the standpoint of mouth sepsis and cardiac conditions, particularly coronary thrombosis.

3. *Bad Thyroid Risks.* Partial or complete thyroidectomy in one stage.

4. *Incomplete Septic Abortions.* Prompt dilatation and curettage in the febrile stage.

5. *Acute Cholecystitis.* Immediate cholecystectomy.

6. *Lymphangitis, Lymphadenitis, Cellulitis.* Early localization or disappearance of the infected process.

Acute rheumatic fever with diseased tonsils or abscessed teeth as the focus of infection often present serious problems in treatment. The physician generally has to treat conservatively, fearful of setting up septicemia or a local spread of sepsis by resorting to surgery in the acute febrile stage. Often the result is that by the time it is considered safe to remove these foci the heart has been irreparably damaged.

Frequently the surgeon is faced with a toxic goiter in which the response to preoperative treatment is unsatisfactory, i.e., the basal rate cannot be brought down to a sufficiently low level to be considered safe for operation, or in an elderly patient with toxic adenomas and a bad cardiac risk.

A case of acute suppurative cholecystitis that the best clinical data indicate should be treated conservatively for twenty-four to forty-eight hours to avoid so-called liver shock, which could during this period sustain even more bile duct and liver damage from the infected gallbladder.

In septic abortion because of well grounded fears of spreading infection locally and even breaking down barriers to

CASE REPORTS

CASE I. No. 99794. Miss G. gave a history of shifting joint pains with swelling, tenderness, and fever for three days prior to admis-

had completely disappeared. The systolic mitral murmur which had been present before operation disappeared. She was sent home on the ninth postoperative day in good condition.

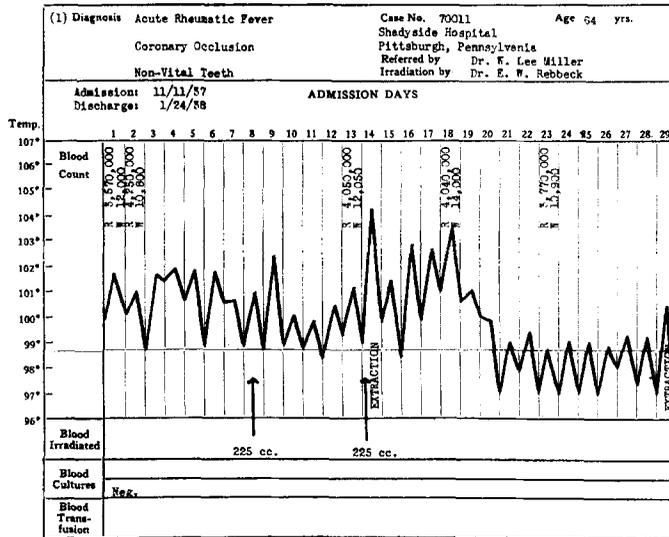


FIG. 2. A, Case 11.

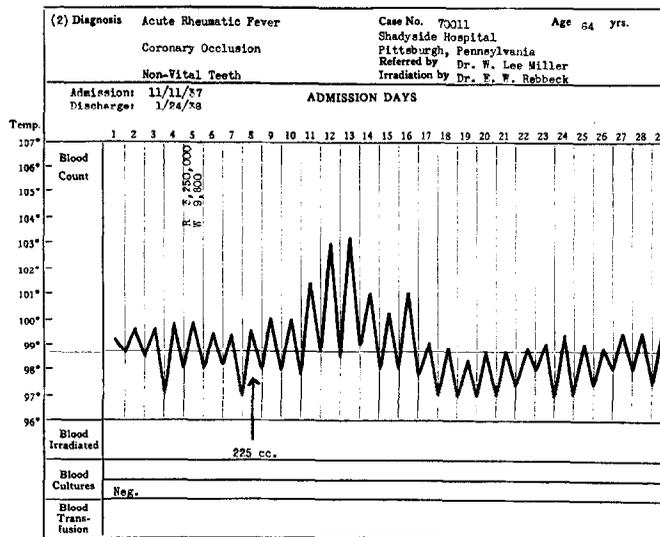


FIG. 2. B, Case 11.

sion. It was decided that the tonsils were the cause of this acute rheumatic fever. On the fifth day of her acute illness preoperative blood irradiation was given followed in one hour by tonsillectomy. A transient Staphylococcus albus appeared in her blood stream immediately after operation. No untoward symptoms developed. Her sedimentation dropped from 76 mm. in one hour to 12 mm. in one hour. On the sixth postoperative day joint symptoms

One month later a peri-apical abscess of the lower left first molar developed, and her joint symptoms began to recur. She was readmitted. Another preoperative blood irradiation was given. The tooth extracted, and this time a transient hemolytic streptococcus appeared in her blood. However, she convalesced uneventfully and was discharged on the eighth postoperative day completely free from heart complication and joint symptoms.

Extraction after irradiation affords the patient only mild discomfort and healing is accelerated. When one considers the and complicated by a septic state which by November 18th, presented a semiconscious patient with a temperature of 101°F., pulse 104,

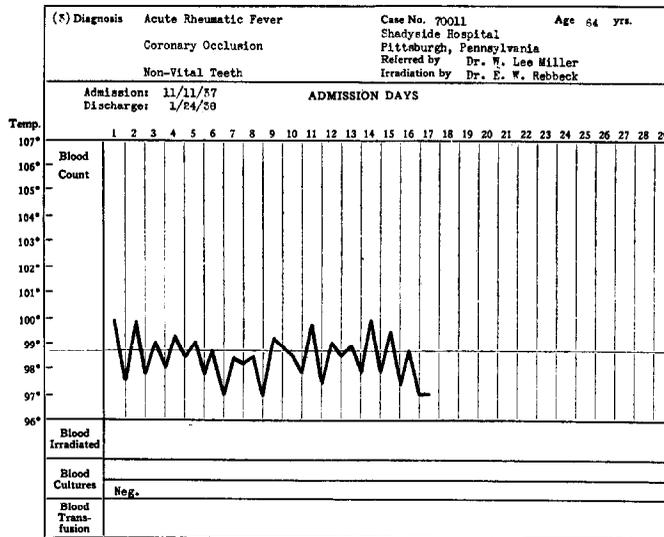


FIG. 2. c, Case II.

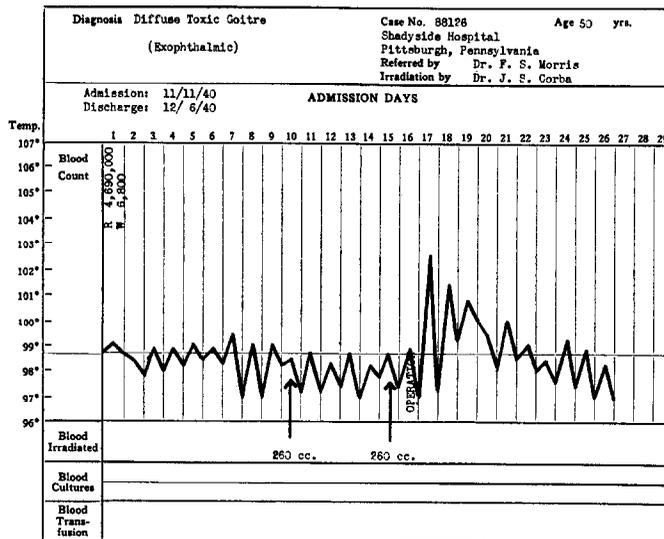


FIG. 3. Case III.

usual conservative method of handling these cases in which so many heart lesions of prominent nature develop, the protection afforded by ultraviolet blood irradiation therapy used preoperatively merits intensive study.

CASE II. No. 70011. Mr. G. suffered an attack of coronary occlusion on November 11, 1937, which was considerably relieved the next day, but acute rheumatic fever supervened on this date, became progressively worse

although his blood urea maximum was only 14.4 mg. The patient had a very septic condition of his gums and teeth with nine retained roots in the lower jaw, six nonvital teeth with retained roots in the upper jaw. Blood irradiation therapy was instituted on November 18th. Within three days his joint symptoms had practically subsided. He was mentally alert. His temperature had subsided to 99°F. With joint symptoms recurring progressively worse the next three days it was decided that in view of the septic mouth condition being the

probable focus of his rheumatic fever, extraction was the only possible means of relief. Blood irradiation therapy was again given on November 24th, and the six teeth in his upper

undoubtedly was a life saving measure in this instance. When last heard of this patient was working at his engineering occupation in August, 1938.

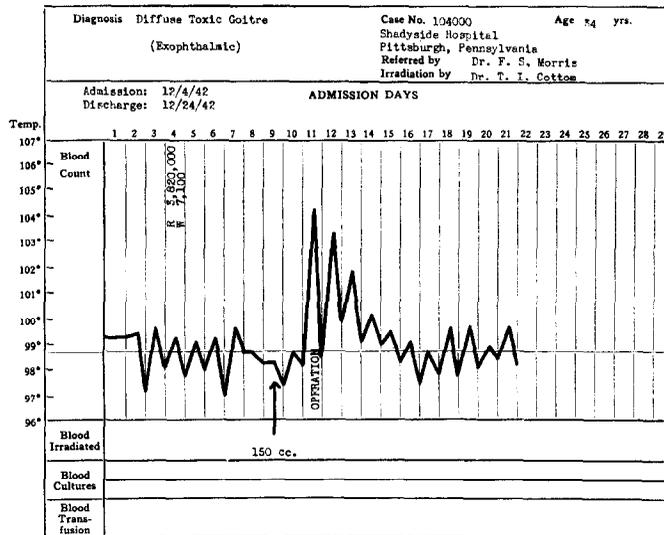


FIG. 4. Case iv.

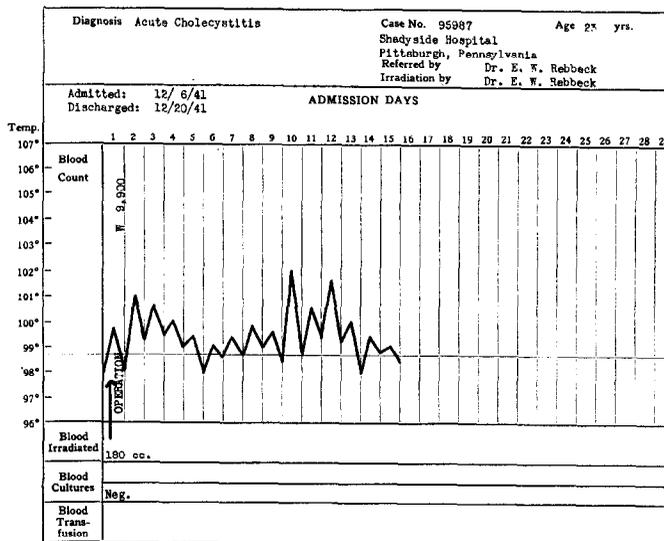


FIG. 5. Case v.

mouth extracted. His peak reaction to this extraction was 103°F. temperature, pulse 120. However, no positive blood cultures were obtained. On December 9th, the remaining nine teeth were extracted, and the peak reaction was 100.4°F., pulse 100. Blood irradiation therapy was again performed on December 17th. The patient was discharged on January 24, 1938, in good general condition. This radical departure in the way of extracting teeth in the presence of acute rheumatic fever

CASE III. No. 88126. Mr. B. had a basal rate on November 11, 1940, plus 86, and plus 62 on November 18th, and plus 62 on November 22nd. Despite rest in bed, Lugol's therapy and phenobarbital. His pulse rate ranged up to a peak of 118. He received blood irradiation therapy on November 20th, and again on November 25th. A thyroid resection was performed on November 27th. His peak reaction was 102.6°F., pulse 136 which had subsided to 99.4°F. temperature and pulse 90 within

forty-eight hours. He was discharged in good condition on December 6, 1940.

Our experience has shown in several other similar cases that preoperative blood

Her peak reaction was a temperature of 104.2°F., pulse 104, and within forty-eight hours her temperature had dropped to 100°F., pulse 84, peak. She progressed to normal

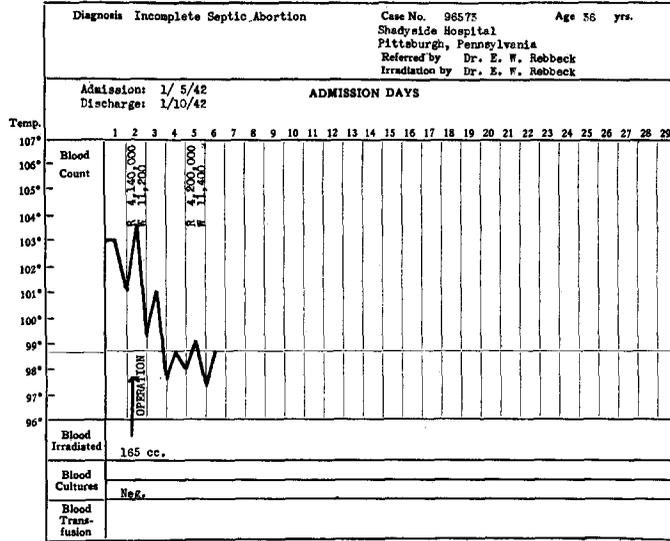


FIG. 6. Case VI.

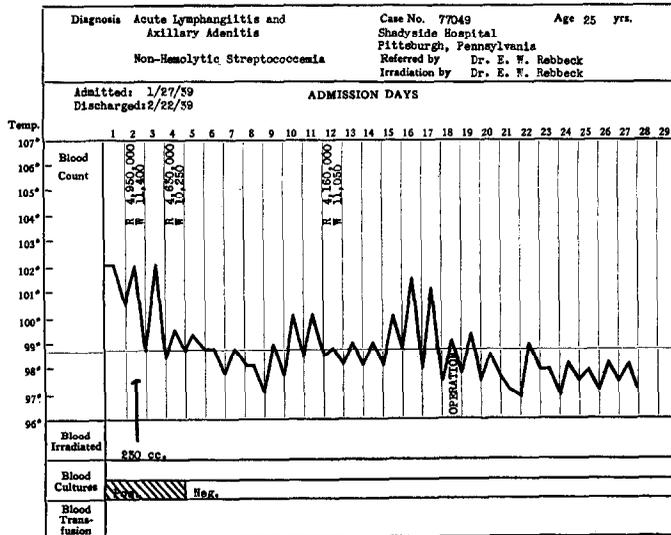


FIG. 7. Case VII.

irradiation affords definite protection to this type of goiter which does not respond to preoperative iodine therapy.

CASE IV. No. 10-4000. Miss Y. had a basal rate of plus 76 on December 4, 1942, plus 86 on December 9th, despite rest in bed, Lugol's solution and phenobarbital. Her pulse rate averaged up to 140. She was quite nervous and restless. Preoperative blood irradiation therapy was given on December 12th, and thyroid resection performed on December 14th.

convalescence and was discharged on December 24, 1942. Her basal rate on January 4, 1943, was minus one, and pathological diagnosis, diffuse toxic goiter (exophthalmic).

This type of goiter, we believe, would be a very precarious operative risk particularly for a one-stage operation.

CASE V. No. 95987. Mrs. P. had an attack of acute cholecystitis and was operated approximately ten hours after her attack began. She

was given preoperative blood irradiation therapy. At operation an enormously distended gallbladder was found with quite thick edematous walls and a stone impacted in the cystic duct. As yet the bile was clear.

In this type of case it is our belief from experience in other patients that if some means is afforded to proceed safely with immediate operation, much less damage is apt to result to the bile ducts and cells of the liver. With the exception of an occasional atelectasis no detrimental reactions have been observed in performing immediate operation in acute cholecystitis. From a period beginning December, 1941, through September, 1942, no atelectasis developed in our surgery, and it is our opinion that this sequel did not occur, despite spinal anesthesia, because these patients were treated by postural lung drainage and careful attention was paid to deep breathing postoperatively (in other words we raised the backrest in all cases approximately thirty degrees immediately after operation). Incidentally, no headaches were observed.

We also believed that the bad operative risk, particularly the toxic cases and elderly patients with serious cardiac conditions, went through their operation much better because they were given blood irradiation therapy before operation.

CASE VI. No. 96573. Mrs. C. admitted taking quinine and using a slippery elm stick to produce abortion. She was pregnant about six weeks. Her bleeding on admission was scant, temperature 103°F., pulse 130. The next morning blood irradiation therapy was given and immediately dilatation and curettage performed using placental forceps and a sharp curet. Tissue examination showed necrotizing placental tissue. Her convalescence was uneventful. She was discharged on the fourth postoperative day in good condition.

This type of patient is dangerous to operate upon in this way both from the standpoint of local spread of infection and septicemia. Blood irradiation has been a remarkable protective therapy for these patients.

CASE VII. No. 77049. Mr. J. was admitted with a marked lymphangitis and axillary adenitis involving the right wrist and arm which occurred from squeezing a small pustule on his wrist. A blood culture taken on admission showed nonhemolytic streptococci. He had severe axillary pain necessitating morphine for its control. The next day blood irradiation was given. His temperature began to recede by lysis. Within twenty-four hours the pain was decidedly relieved; the streaks faded definitely and there was less swelling. Over the next ten days the axilla gradually softened to a point at which incision and drainage was indicated. The same organism was found in the cultured pus. The patient then progressed to an uneventful recovery.

We feel this is an instance frequently observed of localization of infection following blood irradiation. Subsequent blood cultures were negative. In many cases of such a pathological disorder of milder nature the inflammatory process has been seen to subside completely and usually within twenty-four to thirty-six hours.

The foregoing cases were selected for publications as examples of the reactions to surgery when ultraviolet blood irradiation therapy is administered preoperatively. Careful perusal of the charts and case histories show that a safe means of protection is afforded a poor operative risk by use of the Knott technic of ultraviolet blood irradiation therapy preoperatively in at least the pathological conditions mentioned. A marked decrease in the morbidity and mortality in these diseases has been accomplished.

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