Van Lennep (W^m B.)

NECROSIS OF THE FEMUR,

WITH IMPLANTATION OF DECALCIFIED BONE CHIPS.

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In the September number of the *American Journal of the Medical Sciences* there appeared an article by Dr. Nicholas Senn "on the healing of bone cavities by implantation of antiseptic decalcified bone." While reading this paper I saw a case I had operated on over two years ago, where a large cavity in the tibia had taken nearly eight months to heal by the slow process of granulation. The result is a deep depression and a weak cicatrix, which breaks down and ulcerates after every bruise. The attempt had been made to fill the cavity with a blood clot, as had been suggested by Schede a short time before, but this failed. Senn says that the blood clot is too good a culture soil for germs; that the loss of blood, if a large clot is required, may be dangerous; that it may be insufficient, on the other hand, to fill the cavity. He also very justly criticizes the proposition of Neuber to turn down and tack flaps of the soft parts into bone cavities, because the flaps are apt to slough, and in certain cases much healthy bone has to be removed to allow of their being turned in. He proposes to fill the cavity, in place of the clot or the sponge, with chips of decalcified bone. These he prepares as follows: The fresh tibia of an ox is taken and cut across into sections about two inches thick. The medulla is cleaned out and the bone decalcified in dilute muriatic acid, which is frequently changed. The acid is then washed out and neutralized by a weak solution of caustic potash. Thin sections are made in the long axis of the bone, which are kept in sublimated alcohol, 1 to 500.

I immediately prepared a tibia in this manner, and Gemrig & Co. have since obtained for me some specimens like those used in Senn's experiments. They are not quite as completely decalcified as those I prepared and used.

I was about to operate on a young man for extensive necrosis of the femur, and, with his consent, determined to give this method a trial. There were two sinuses just above the knee, a large one on the inside and a small one on the outside, through both of which rough bone could be readily felt. A number of bits had been discharged, and one large sequestrum seemed loose. Higher up, on the outer side of the thigh, was a deeply depressed, long, adherent cicatrix, resulting from a former similar trouble of several years' duration. The abscess had been incised, and nature allowed to complete the cure. The scar is weak and tender.

Operation, September 23, 1889, at the Camden Homœopathic Hospital. After the usual antiseptic precautions, the limb having been rendered bloodless by the Esmarch bandage, an incision was made up and down from the internal sinus, freely exposing the bone. Two large sequestra and a number of small pieces were removed, leaving a deep groove running from the internal condyle upward for about six inches, and ending in a pocket. Just below the latter was an opening through the bone to the sinus on the outer side. The rough places were rendered smooth with gouge and chisel, the whole suppurating area carefully and thoroughly scraped, and the inflamed soft parts freely excised with curved scissors. After washing out with hot water, strongly sublimated, twelve per cent. solution of chloride of zinc was applied with a brush; the irrigation was repeated, and iodoform blown in. The chips, previously soaked in weak sublimate and dusted with iodoform, were taken from a disinfected towel and tightly packed into the whole cavity. There being no periosteum available with which to cover the chips, the soft parts over both openings were drawn together by buried catgut and superficial silk sutures. This was accomplished with difficulty, producing considerable tension, and a small aperture was therefore left on the inner side of the thigh for drainage. Iodoform dressings were applied, and the limb done up on a posterior metal splint. The Esmarch tubing was then removed.

There was a smart fever the next day (103°) and good deal of oozing, the dressings becoming saturated with blood. They were changed, and the drainage opening slightly enlarged to relieve tension. The bone chips could be seen entangled in a dark clot. The wounds closed per primam, except at this point, which suppurated subsequently. He went to his home in the country on the twelfth day, returning to have the opening washed and dressed from time to time.

The bone chips have evidently done their work, as the contour of the limb is well preserved and the cicatrix only depressed at the point mentioned. There must have been a new formation of bone, for a hard elevated lump can be felt instead of the deep groove. In its centre is a crater-like depression where the wound suppurated. Only a couple of chips were discharged and found in the dressings.

The case was anything but favorable for implantation, and required most scrupulous scraping and disinfection, especially in the pocket at the upper end and the opening through the bone. There was no periosteum with which to cover the chips, and the soft parts were drawn together with great difficulty. The tension and the septic cavity caused me considerable anxiety, and when the temperature shot up, I feared that I would have to open the wound and allow healing to take place by the slow and deforming process of granulation. While the blood clot is used in the interstices between the chips, it is supported by them, and breaking down is further prevented by their being not only aseptic but antiseptic. For this reason they also tend to counteract the effects of any shortcomings in disinfection.

The result is certainly very satisfactory, healing being rapid and without deformity or tender scar. I feel that the case should be reported as one of the first since Senn's publication. Besides, it is our duty to put on record successes and failures with any new method in order to help define its value.