

loose bone, etc., between the fragments. As to the manner employed to hold the fragments, no one plan as Lane's will answer best in all cases. Thin vanadium steel, silver plates, staples, external clamps and sometimes even catgut can be employed. The material must be suited to the particular fracture.

I only employ drainage where infection is threatened or occurred before the case had been turned over to our care.

Dr. Crawford (closes): I have nothing to add to the discussion. I quite agree with Dr. Leigh and the other gentlemen.

My reference was solely confined to the knee-joint and I have had the open treatment and gotten good results. One was with a negro, a railroad man, who had a fracture of the tibia, and he got well and disappeared in six weeks and the claim agent told me he got off very easy with him for \$80. As the gentleman from North Carolina says, we have to do the best we can, and it is not possible always to follow Dr. Leigh's plan.

TRAUMATIC EMPHYSEMA AND EMPYEMA.*

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The object of this paper is to advocate the formalin and glycerin treatment of empyema and to add some extreme cases to the list already so treated and reported.

The method is that of Dr. J. B. Murphy. He claims that it is capable of curing any empyema not connected with a branchus or other hollow viscus. After several years of experience with the method I am strongly impressed with its efficiency. The theory and the practical results accurately coincide.

In this method the pus is aspirated and through the same needle several ounces of a two per cent mixture of formalin in glycerin are injected. Following the first injection the fluid usually re-forms. After an interval of a week the process should be repeated. More frequent aspirations without injections should be done if demanded by dyspnea. After the third or fourth treatment, often earlier, the fluid begins to lose its purulent character and gradually assumes the appearance of clear or slightly reddish, cloudy serum. At this stage

the injections are discontinued and the innocuous fluid is gradually absorbed. It is very important that the mixture be at least twenty-four hours old before using.

On September 16, 1914, a negro man about thirty years of age was referred to me with the history of having been jabbed under the left axilla by the blunt end of a board carried slowly along by a moving freight car. There was no bloody expectoration and other symptoms of severe injury were absent, except the extensive emphysema that appeared about the forty-eighth hour after the injury. This was of the interstitial variety and due evidently to injury at the root of the lung, the air traveling along the trachea until it reached the subcutaneous tissue of the neck and the chest walls, covering the neck to the ears, the cheeks and the chest.

On October 5th there were fever and other signs of empyema and six ounces of thick pus were aspirated through a large needle and four ounces of a two per cent formalin-in-sterile-glycerin mixture injected. On October 12th ten ounces of a more liquid pus were aspirated and six ounces of the formalin mixture injected. On October 21st twenty-four ounces of very fluid pus were aspirated and eight ounces of the formalin mixture injected. The following day another aspiration was done, removing fifty-four ounces of liquid pus, and eight ounces of the mixture were injected.

On the 28th the symptoms of empyema had almost disappeared and only one ounce of pus could be withdrawn. No injection was made at this time and there followed no further evidence of accumulation in the cavity.

A young child so long neglected with empyema that the pus had bulged up at several points above the left clavicle and between the ribs of the left side closely resembling multiple abscesses, was aspirated and injected without anaesthesia. Just at the termination of the procedure the child collapsed and was considered by both physicians in attendance to be dead. However, the child rallied and made a rapid recovery, with only one subsequent aspiration and injection.

I have had experience with several other less severe cases of empyema in children in which the method was used without complication, and with the greatest satisfaction. In no case that I have seen has there been a fatal termination, and no case has been burdened with a chronic fistulous tract so common after thoracotomy and rib resection.

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