

and two of erysipelatous complications, but the majority of the deaths were reported from exhaustion and from the various affections arising during their hospital residence. Hospitalism was then an important factor in results. In aggregation out of the 5,194 cases of shot fractures of the forearm 2,970 were treated conservatively. The graver complications among these were comparatively infrequent. There were, however, twenty-seven deaths from pyemia, four from tetanus, thirteen from secondary hemorrhage. There were fifty-seven cases of severe secondary hemorrhages treated out of this large series requiring in different cases ligation of the brachial, radial, ulnar and interosseous arteries.

Excisions in the continuity of the bones of the forearm were practiced in 986 out of the 5,194 cases of shot injuries of the forearm, with a mortality of 11.2 per cent.; 496 of these excisions were of the ulna, 413 of the radius and 59 of portions of the shafts of both bones; 18 cases were not specified as to the bone or part of it that was excised. Excisions were classified as primary when done before swelling or inflammation occurred, or in general within thirty-six to forty-eight hours from date of injury; intermediate when done later, or within twenty to thirty days, and secondary when done after thirty days. Primary excision of one or both bones was done in 665 of the cases with a mortality of 71,—10.6 per cent. Five of the cases were undetermined. The excision involved the ulna in 321 cases, the radius in 291, both bones in 40 and in 13 the seat of the excision was not specified. Forty-four of these cases were Confederate soldiers.

Of the forty excisions of both bones, thirty-four were successful as regards the saving of life, but eighteen of them afterward required amputation, and among the twenty-two who retained their arms not a single good result was obtained. In fact the recovered cases who retained their limbs were worse off than if amputation had been done as the limbs were useless appendages and a hindrance. Excision of the shaft of the ulna shows 290 recoveries. The length of the shaft removed varied from one to six inches, in one case the entire diaphysis was removed. In one of this series excision was made in the radius of the right arm and the ulna of the left. This man died in 1872 and a short time before his death pension examiner, O. M. Stockwell, of Port Huron, Mich., reported his "disability is almost equivalent to the loss of both hands" and in general the ulterior pension reports in these cases show a disappointment in regard to the expected usefulness of the limbs. Of 413 primary excisions of the shaft of the radius 256 recovered.

Table 126 gives 589 cases of recovery after primary excisions of the bones of the forearm for shot wounds (36 were Confederate) of which 147 were returned to modified duty and 406 discharged from the service.

Intermediary Excisions of the Bones of the Forearm.—Of these 149 cases with a mortality of 19.4 per cent., or 29 deaths are reported; 9 cases involving both bones, 64 the ulna and 47 the radius. Among the 120 cases of recovery after intermediary excision of the forearm were eleven of secondary hemorrhage, three consecutive amputations in the forearm and six in the upper arm. Of the twenty-nine deaths of this series the greater number were from pyemia and pyemic complications. None of these were done on both arms, eighteen were of the ulna and eleven of the radius. Unsuccessful consecutive amputations were

done in the upper arm in five cases. The fatal issue in one of them was thought to be due to the concomitant fracture of the spinous process of one of the dorsal vertebrae. There were forty secondary excisions made after thirty days from date of injury. Seven of these involved the shaft of both bones, twenty-one of the ulna only, and eleven of the radius and one not specified. There were four fatal cases of these secondary operations. Beside the different series of cases above shown in which a classification as to date of operation was given, there were 132 cases of excision of the forearm not classified, in which the small mortality rate of 4.3 per cent. was reported.

#### RECAPITULATION IN AGGREGATE.

This large number of excisions, 2,251, of the bones of the forearm compares unfavorably in results with the larger number, 2,943 treated on conservative principles, both as regards mortality and subsequent usefulness of the limbs. Could aseptic, or even antiseptic surgery be made available in future wars, the results would no doubt be improved, and resection and amputation would be found unnecessary in a large portion of cases in which they were practiced in preantiseptic times.

The mortality 2,943 cases of shot fracture of the forearm treated by conservatism was 6.4 per cent. and of the 965 treated by excision 11.2 per cent. and of 1,256 treated by amputation primarily or consecutively performed, the death rate was 16.3.

In studying these statistical results we note with interest if not surprise the great difference in the mortality of cases treated conservatively and those treated by excision or amputation. The fact, however, is not to be overlooked that the milder cases were as a rule treated conservatively and the more severe by excision or primary or conservative amputation. Unless antiseptic surgery can improve the results of excision of the bones of the forearm the operation ought to be abandoned in military practice and the same remark may apply equally to railroad surgery.

#### AN UNUSUAL CASE OF FRACTURE OF THE SKULL.

Read at the Second Annual Meeting of the American Academy of Railway Surgeons, held at Chicago, Ill., Sept. 25-27, 1895.

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I have to beg the indulgence of the Academy for bringing up in a very new and crude way a history of a case which has always been extremely interesting to me, and I will explain how it is that I am unable to give more complete data of the case. It is a case of fracture of the skull which occurred during my service at the State Emigrant Hospital, New York, when that institution was located upon Ward's Island and under the government of the New York commissioners of immigration. Some three or four years following my service the department was taken out of the hands of the New York State commissioners of immigration and put into the hands of a single-headed commission which was under the general government, and the hospital was removed from Ward's Island to Ellis Island in the harbor so that my data in regard to the case are rendered inaccessible. It is a case I should have reported at the time it occurred, excepting that I was very young in the profession and thought that it would be rather presumptuous for one who was but a recent graduate to rush into print. My

only apology for now presenting it is that the case is interesting to show the amount of injury which the skull and its contents will occasionally tolerate, not on account of good treatment, but perhaps in spite of the treatment, and the fact that the case has never been presented before.

In the summer of 1882 an Italian, about thirty years of age, belonging to a construction gang on the West Shore Railway, then being built, was admitted to my service in the state Emigrant Hospital, New York, with a compound fracture of the bones of the skull, and with the following history, partly obtained from the Chambers Street Hospital, and partly from the patient after his restoration to complete consciousness: Three days prior to coming under my care, while at work in a rock-cutting, he was instructed to dig out a blast which had failed to explode, with the result that the heavy charge exploded in his face. He was taken across the river to Chambers Street Hospital, and on the third day transferred to the State Emigrant Hospital, on account of the development of erysipelas in the margins of the wound, as no septic cases were allowed to remain in the Chambers Street wards.

Physical signs on admission were as follows: A compound fracture of the frontal bone extending transversely across the forehead just above the frontal eminences and below the hairy margin of the scalp. The wound through the soft tissues was about five and one half inches in length and gaping to about one and one half inches at its widest part; extending from a point about two inches superior to the right external angular process to a point about equally distant above the middle of the left superciliary ridge, and communicating freely with the cranial cavity and brain through the subjacent fracture and an equally large laceration through the meninges. The cutaneous surface surrounding the wound for a distance of about an inch from its margins was swollen and reddened with an angry erysipelatous blush. The bottom of the wound was filled with detritus composed of necrosed brain tissue, small fragments of rock and some loose bony fragments. The fracture could be traced beyond the limit of the open wound to the left external angular process; thence it extended through the roof of the left orbit, emerging in the nasal bones which it traversed obliquely downward, through the right malar bone, and thence outward and upward to its point of origin near the superior extremity of the right temporal ridge of the frontal bone. It extended across the base of the anterior portion of the skull from the left external angular process through the left orbital plate of the frontal bone, and posterior to and including the right orbit, or the greater part of it, to a point on the external aspect of the right great wing of the sphenoid, including in the parts fractured from the rest of the cranium nearly all of the frontal and ethmoid, and portions of the sphenoid, nasal and right malar bones. This was proven by the mobility of the portion fractured off, which was so mobile as to move back and forth with every cardiac impulse transmitted through the cranial pulsations, and by the fact that the upper right portion of the face, including the right orbit and globe of the eye, was advanced anterior to the plane of the upper left portion of the face and left eye. This obliquity of the frontal structures and eyes remained after the wound was healed, the right eye being about five eighths of an inch anterior to the plane of its fellow, and the facial deformity was well shown in a tin-type which he brought me, but

which I unfortunately left at the hospital at the end of my term of service.

The patient was in a condition of mild stuporous delirium, answering questions when aroused, but irrationally and *mal a propos*. Through loss of notes I am unable to give clinical record of pulse and temperature.

Confronted with the above conditions I considered his injuries necessarily fatal, and believing I could do no harm in contributing to the fatal issue, I was extremely bold in exploring and cleaning out the wound in the cranial cavity, introducing all the fingers of my hand into the cranium so that in the manipulation the anterior portion of the right anterior lobe of the brain rested in my hand on the palmar surface of the fingers. In this manner, and assisted by irrigation I removed the detritus, including, I should think, as much as half an ounce of softened and detached brain substance. The selection of dressing next perplexed me. You will remember this was in 1882 in the early days of antiseptics, and the only agents then in use to modify septic conditions were carbolic acid and iodoform, neither of which I wished to apply to a wound communicating so freely with the brain on account of their irritant properties. I contented myself with applying compresses kept constantly saturated with cold water, and to my surprise the patient immediately and steadily improved; the erysipelatous redness, fever and delirium disappeared within a week or ten days; the wound granulated and cicatrized from the edges, and he progressed to an uneventful recovery, and was discharged cured about two months after his admission to the hospital. After his delirium subsided he showed no impairment of mental powers nor loss of function save the sense of smell, which was completely lost through rupture of the olfactory filaments.

On his discharge I asked him to report after the lapse of two or three months that I might further examine as to his cerebral functions, and at the end of two months he presented himself again bringing a picture showing his facial deformity as stated above, and showing no mental deterioration.

#### DISCUSSION.

DR. DALBY—The paper just read and case cited by Dr. Peck—skull fractures and to what extent these fractures may go and still the patient recover—simply adds another to the already long list. We have seen compound fractures in such aggravated shapes that seemed as though recovery would simply be impossible. As he stated in the paper, in this case he got well in spite of any medical attention; I think a great many of them do. In cases of fractured skull as they come under the railway surgeon's attention, beyond cleansing the wound and making it as aseptic as possible, relieving the pressure, is about as much as we can do. The case he cites is certainly an interesting one, but, as I stated, only another of a long list of these horrible fractures where patients recover in spite of all we may do and may not do. As I have stated, there is very little in such cases that can be done anyhow, even in the surgical field. After we have made the wound aseptic and relieved the pressure we have performed about all the surgeon can do.

**Valerianate of Antipyrin.**—A writer in the *Boston Medical and Surgical Journal* recommends that the following formula be used to prepare this salt. It has been used in cases of nervous prostration with recurrent hysteric symptoms: Antipyrin, grs. xxvii; aq. destillat. q. s. ad ft. sol.; ft. sol. et adde acidi valerianici, gtt. xv. Misce. Shake well, and stand aside to allow the salt to crystallize.