

In the two series, there were fifty cases with seven failures and three partial successes, or 86 per cent. of successes. Among the cases were 2 of incomplete abortion; 2 of induction in conjunction with hydrostatic bags; 2 of placenta praevia; 2 of cesarean section; 2 of puerperal metrorrhagia, and 1 in which the extract was used as a galactagogue. The balance, cases of inertia, chiefly secondary, included one breech and several occiput posterior cases. In the seven classed as failures it was necessary to resort to forceps delivery.

Secondly, as pituitary extract undoubtedly does supplant the forceps in many cases, it might be well to compare the fetal mortality.

In 147 cases collected by Madill and Allan,⁴ in which pituitary extract was used, there were four deaths, or 2.7 per cent. In 106 forceps deliveries, fifteen deaths, or 14 per cent.; at the Basle clinic, 10.5 per cent.; Edgar (208 cases), 5.7 per cent.; at Dresden, 15.63 per cent.

The maternal prognosis is undoubtedly much better than with forceps, as the chances for infection are minimized.

Thirdly, as to the average time elapsing between the injection of the extract and the birth of the child.

In a series of cases noted by Madill and Allan at the Rotunda Hospital, this was in primiparae, 22 minutes, in multiparae, 11 minutes. Anderson⁵ (Buffalo) gives in 10 cases, which he admits were selected from a large series, an average of 27 minutes. Druskin of New York, 50 minutes. My first series, 18 cases, 55 minutes.

Dividing these, the time in first stage injection cases was 100 minutes; in second stage injection cases, 38 minutes.

In my second series the time was 26 minutes; the minimum in the second series being five minutes. My explanation of this is that since writing my first paper I have narrowed my indications more and used pituitary extract later in labor.

In summarizing I will repeat the conclusions of my original paper.

SUMMARY

1. In pituitary extract we have the most powerful stimulant to uterine contraction yet discovered.
2. Its greatest value is its use in uterine inertia.
3. The ideal time for its exhibition is in the second stage, although good results follow its employment earlier; in these cases it is usually necessary to repeat.
4. No untoward results, such as post-partum hemorrhage or asphyxia, were noted for mother or child in the fifty cases.
5. It shortens the third stage.
6. It renders catheterization post partum almost never necessary.
7. It has no place in the normal case.
8. Preparations for delivery should be made at time of injection, such as sterilizing hands and gloves.
9. The facilities for giving an anesthetic at a moment's notice are prerequisite, for we do not know the susceptibility of the uterine muscle in any particular case.
10. Pituitary extract may advantageously be supplemented by seminarcosis when the presenting part is on the perineum. (This would naturally mean chloro-

form, ether, or pituitary extract. Nitrous oxid is contra-indicated in scopolamin narcosis.)

11. Pituitary extract *must* be used judiciously and with a due appreciation of the possible dangers of so powerful a uterine stimulant. This is the most important point.

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WOUNDS RECEIVED IN BATTLE

SURGICAL AND GENERAL OBSERVATIONS MADE DURING RECENT SERVICE IN AUSTRIA

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LOS ANGELES

In June, 1914, I was privileged to become a voluntary assistant in the second eye clinic of the Vienna General Hospital, the service of Hofrat Fuchs. At the outbreak of the war two wards of this service were placed under Professor Budinger, and on volunteering to serve without pay, I was given charge, with the understanding that all the eye cases of this division were to be referred to these wards so far as possible. I was active here for over three months, doing practically all the eye and brain surgery as well as all of the general major surgery of these wards, and assisting in the surgery of the five other wards of Professor Budinger's service.

Including 322 cases of my own, I had the privilege of observing about 1,100 cases of projectile wounds and war injuries of various kinds during this period, and my generalizations are drawn from this mass of material.

Of my own cases, 177 were bullet wounds, 95 were shrapnel, 4 were shell wounds, 7 carried bayonet wounds, 17 were cases of accidental injuries such as crushes of the extremities from the wheels of gun carriages, or fractured ribs from falls into trenches, and 22 were purely medical cases, mistakenly referred to us in the confusion which always accompanied the arrival of a great transport of wounded. The large excess of bullet and shrapnel wounds over wounds produced by shells, the reverse being the case on the French front, was the direct result of the more mobile type of operations on the Russian border, shrapnel being generally employed against masses of troops moving in the open, while shells of various types find their chief use in searching out the depths of trenches and in demolishing cover.

Nearly 63 per cent. of our bullet wound cases were infected, and over 85 per cent. of the shrapnel cases, while of the 188 infected wounds embracing all degrees of sepsis, fifty-eight, or approximately one in every three, came to operation. This high percentage of infection of shrapnel wounds accords with the English observations that practically all shrapnel and shell wounds became infected.

Six septic cases were lost, three being perforating bullet wounds of the knee, in which radical measures were deferred until too late, or not undertaken at all; one was a comminuted open fracture of the left forearm with tetanus, early amputation having been refused; one patient died from peritonitis and pyopneumothorax, and one from meningitis, secondary to a shrapnel perforation of the lumbar spine. The two other deaths were from spinal cord perforation and from spinal cord pulpification.

4. Madill, D. G., and Allan, R. M.: Use of Pituitary Extract in Labor, Surg., Gynec. and Obst., August, 1914, p. 241.
5. Anderson: Buffalo Med. Jour., May, 1914.

Three out of four of my patients with tetanus recovered under antitoxin and chloral. In one of these, a compound fracture of the left hand, amputation in the middle of the forearm immediately turned the scale in the patient's favor. All of these cases were noticeable, on entrance, for their very foul, black-gangrenous wounds and free suppuration.

Three patients with erysipelas and two with gas bacillus infection recovered, amputation of a leg being necessary in one of the latter cases.

Although many of the men were nervously upset in connection with their wounds and the trials of transport, the diagnosis of war psychosis (traumatic neurosis) was made in but six cases. The story usually told by these patients was that the violence of a shrapnel explosion had hurled them several meters into the air, and when consciousness returned, they found themselves partly paralyzed for motion, speech, hearing or vision as the case might be, and yet unwounded. These men regained their control very slowly, especially the hysteric amauroses, and were subject to excited dreams, melancholy and fits of weeping.

Amputations were done for tetanus, gas bacillus infection, torsion necrosis of a fractured leg and for septic knee joints.

At first small multiple incisions were the rule in phlegmons, but they quickly gave way to long, sweeping incisions, which alone gave the needed wide-open drainage.

I noticed, as all other observers have done, that wounds of the left hand and forearm were very common. In the shrapnel wounds of the hands, the terminal phalanges were nearly always torn off. Although literally hundreds of lacerated and infected fingers were seen and treated, in only one case was an amputation done.

Wounds of the bones were remarkable for the almost complete absence of the classical round perforations. Out of 101 such wounds, only two were simple perforations without fracture, while in most cases the comminution was very extensive.

Only one direct abdominal perforation reached us, and it had healed without operation, before the arrival of the patient. The entrance wound lay 2 cm. to the left and above the umbilicus and led slightly downward and to the left. There was no wound of exit. Our other abdominal patient received a rifle bullet at about 400 yards while lying on his left side. The bullet entered in the right supraclavicular fossa, pierced the scapula and followed the contour of the chest downward until it reached the eighth rib in the posterior axillary line. Here it comminuted the eighth, ninth and tenth ribs, the fragments of which acted as secondary missiles and tore open the pleura and peritoneum and deeply lacerated the liver. Despite the freest drainage, the patient died from peritonitis and pyopneumothorax.

Our experience with bullet perforations of the knees was rather unhappy. Of six cases, two made a spontaneous and functional recovery. In the Budinger clinic, when such wounds became septic the custom was to make lateral and posterior incisions over the joint, to open the subcrural bursa freely above and to irrigate with a solution of hydrogen peroxid. One patient recovered after I had replaced the peroxid irrigations by salt solution. The other cases, in which amputation could have been successfully performed at the very beginning of their symptoms of increasing general sepsis, were allowed to drift into deeper sepsis,

despite my requests to be permitted to amputate. This permission was given in one case already overwhelmed by toxic poison, but naturally the operation was too late.

I believe that the reluctance to amputate was the result of the altogether laudable desire to keep down the percentage of amputations; but in my opinion conservatism has little place in septic bullet wounds of the knee joints after the first evidence of beginning generalized poisoning.

Our method of making the flaps as long as possible, depending on the extent of involvement of the skin, rolling them back until they paralleled the direction of the limb and holding them in this position by the dressing, gave the freest possible drainage, kept every part of the large wound open to daily inspection, and minimized the amount of secondary operative procedure.

Recovery took place in all of our lung perforations. One patient was a Russian who recovered despite his voluntary starvation for the first three days after admission, for fear he would be given poison in his food and in spite of pneumothorax on the injured side, pneumonia of the other lung, a bayonet wound in the right scapular region, another in the left abdominal wall and two deep and ugly shrapnel tears in the groins. In these cases the common symptom remaining at the time of discharge was a slight dyspnea, which became a little noticeable on exertion.

Death occurred in three of our vertebral cases. One patient, with a transverse division of the lower cervical cord, died shortly after admission; another, judged too weak to withstand operation, died from meningitis following the lodgment of a shrapnel ball between the first and second lumbar vertebrae, with consequent spinal fistula and infection; the third, completely paralyzed below the nipples, and dyspneic, had an oblique wound of entrance just over the right transverse process of the fourth dorsal vertebra. A wide laminectomy of the fourth, fifth and sixth dorsal vertebrae exposed a perforated and fractured base of the spinous process of the fifth. The bullet had lodged in the deep muscles of the left side and had not come into contact with the cord. Nevertheless, the cord was so pulpified and so like custard in structure, that it could scarcely be recognized. This was a marked example of cord disruption produced by molecular vibration. This case is in contrast to another, presenting a small clean wound of entrance about 5 cm. to the right of the body of the eighth dorsal. The bullet passed through the spinous process of this vertebrae, in much the same manner as in the previous case, but emerged, carrying much of this process before it as a secondary missile which tore out the whole adjacent mass of spinal muscles and left a great, gaping hole of about the size of two fists. The patient recovered without a symptom referable to any disturbance of the cord, although he was left with a sharp left lateral curve.

Another patient recovered after the removal of a shrapnel bullet from between the third and fourth lumbar vertebrae, where it had driven spicules of bone ahead of it and was pressing slightly on the cord. The only symptoms before operation, apart from the local discomfort, were paresthesia and a sensation of cold in the right heel and the toes of the right foot.

Still another patient lost the right transverse process of the sixth cervical vertebrae, the bullet slipping benignantly through the cervical plexus, to lodge in the mastoid. A continuous neuralgic pain and buzzing in

the right ear ceased with the removal of the missile from the mastoid, but the patient had a noticeable right torticollis on discharge.

The immunity of the great cervical vessels and nerves seems to be remarkable, for we had many cases in which bullets passed through the whole length of the neck, or crossed the whole neck obliquely from above downward, or passed transversely without the slightest injury to nerves or vessels. These were the fortunate cases, however, for in those in which lacerations of the great vessels occurred, the men never lived to achieve even first aid attention.

If there were time for diagnostic reflection on the firing line, a study of the rapidly fatal cases would give interesting symptomatic and prognostic data.

Wounds of the head are probably the most frequent of all wounds, and are possibly the most frequent causes of immediate death. This is certainly true of trench warfare, and yet the large number of cases of wounded hands and arms which reach the base and civil hospitals give the false impression that these are the parts most frequently wounded.

Practically every close-range shot of the cranium is fatal at once, from complete disruption of the brain and fragmentation of the skull. The length of the path of the bullet in the brain, however, influences the amount of destruction and the chance of recovery, as the destructive effect is in direct proportion to the amount of brain substance set in motion by the energy of the bullet. The shots in which recovery is most hopeful are those in which the frontal bone is guttered, with a corresponding guttering of the frontal convolutions. The tolerance of this part of the brain is far greater than has been supposed, and I have seen a number of cases of this sort in which the patients recovered from all the immediate effects of their injury.

In trephining these cases, and they all come to trephine or elevation of depressed bone, the caution is often necessary of waiting until the usual mild infection has subsided. Neglect of this rather elementary precaution was the direct cause of death in four successive trephine cases in one of the Vienna services. When symptoms of an abscess of the brain, or other focal symptoms make interference necessary under such conditions, a guarded prognosis must be made.

In cranial wounds the most careful roentgenographic study is often necessary for accurate diagnosis and determination of the extent of subcutaneous destruction. In the case of Lieutenant F., a bullet traversed the right neck and face, ruptured the eye by indirect violence and emerged through the right external angular process. Under the Roentgen ray, an apparently beginning trismus of tetanus resolved itself into a comminution of the right coronoid process. In a case of through-and-through perforation of both petrous bones, a syndrome which simulated the meningitis of an infected basilar fracture was shown by Roentgen ray to be merely a phlegmon of the wound of exit. In one case a small abscess of the brain was recognized roentgenographically and evacuated before dangerous extension could occur. In another case of gutter shot of the outer table, exactly over the sagittal suture, no fracture of the inner table could be found by repeated frontal and lateral roentgenograms, and as the only symptoms were slight headache and vertigo, the rule of exploring all these cases was departed from and the patient made a complete recovery.

Wounds of the eyes and of their immediate surroundings were so diverse and interesting that they have been made the subject of a separate paper. One of their remarkable features was the frequency with which the front of the external wall of the orbit was cleanly shot away, the right orbit suffering about twice as often as the left. In nearly every case the resulting exposure was so like that sought from an ideal Krönlein operation that the injury became known as the "Krönlein shot," at my suggestion. The number of totally blind, following the destruction of both eyes or optic nerves, is appalling.

The cases of bayonet wounds which reached the general hospital were more or less trivial. Bayonet fighting is very deadly, and as the wounds are high, in the neck or upper chest, death usually follows promptly from hemorrhage. The modern bayonet is used as an aid in intrenching and also, if saw-toothed, is often used for such purposes as sawing wood; hence infection is the rule in the surviving cases.

Apparently all the writing of earlier wars had left no impress on the doctors at the front, for in the earlier days of the war, many patients returned beautifully tamponaded with gauze, or with pads of cotton next to the wound and so dried and hardened by the secretion that they formed most efficient plugs. Iodoform powder and tincture of iodine were also used, but in common with the cotton dressings, they coagulated the discharge of blood and serum and patients often reached the general hospitals with the skin distended almost to bursting with thick pus, gangrenous muscle and bone fragments. Later, practice became fairly well standardized and plain gauze dressings the rule.

I venture to say that the final statistics of this war will be quite unlike those of any which preceded it. The incidence of sepsis, in the early months at least, can certainly not be duplicated since medieval times; the proportion of permanently disabled men seems far greater than ever, and the immediate mortality is very high, as a result of the close-range firing, the frequency and extent of hand-to-hand combat and the avowed determination of whole army corps to give no quarter.

One may further venture to ask if the large number of slightly wounded who are so promptly returned to the front in this war may not be a considerable factor in its prolongation.

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Sanitary Improvement in Toronto.—In 1912 a house-to-house inspection revealed 17,181 yard privies in Toronto. In December, 1914, there were only 4,890. In two years the Department of Health abolished 12,291 privies, a very satisfactory record and one probably unique on the continent of America.—The general death rate for Toronto in 1914 was lower than that attained in any American or British city in 1913, being 11.2, while that for 1913 was 12.9.—The improvement in the death rates in Toronto from typhoid fever, scarlet fever and diphtheria is seen in the following statistics: In 1910 the death rate per 100,000 in the above order was 40.9, 23.8, 42; in 1914 it was 7.7, 6.6, 16. This shows an improvement percentage of 81, 72, 62. Altogether, Toronto had 594 fewer deaths than in the previous year. Ordinarily it is customary to give credit for such good work to the health departments; but in Toronto, a chiropractor rushes into public print to state that the reason lies in the fact that Toronto is blessed with more chiropractors than any other city in America, and that diseases are, therefore, more quickly cured. Where do the osteopaths, neuropaths and the Christian Scientists come in as regards this great preventive work?