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AMPUTATION AND RE-AMPUTATION.

By Temporary Lieutenant-Colonel G. A. Wright, F.R.C.S.
Royal Army Medical Corps.
Emeritus Professor of Surgery, Victoria University, Manchester.

In the Lancet of October 9, 1915, the writer made some remarks upon
the objections to "amputation" by plane circular section of a limb—the
"guillotine" or "flush" amputation so-called. He suggested that the
practice is an undesirable one in cases other than those of "gas gangrene"
even if it is defensible when that condition exists.

Since the date of that communication several other cases of plane
circular sections of limbs have been admitted here, some of which illustrate
the objections to the practice.

Illustrations of three such examples are given to show the state of the
stumps.

Case 1 (fig. 1), showing protruding bone covered with granulations,
was that of Pte. B., aged 18, who was wounded in the knee by a rifle
bullet on November 9, 1915. No record was received with him, but it
appears that two operations were done and drainage tubes put in and
finally the limb was removed on December 10, 1915. Seven weeks later
he was admitted to this hospital. At that time there was a granulating
area about three inches by three inches. From this area the end of the
femur protruded—the bone itself was also covered with granulations.
Re-amputation was done on March 22, by Captain Judson, R.A.M.C.
This was evidently not a case of gas gangrene and we had no means of
knowing why an ordinary amputation was not done and the need for a
later operation avoided.

Case 2 was that of Pte. M., aged 21. He was wounded in Gallipoli,
on December 15, 1915. The left knee was injured by a grenade. Sixteen
days later the limb was removed on board a Hospital Ship. He was
admitted to Whalley on February 1, 1916.

Thirty-one days after the operation the stump showed a large conical
granulating area with 1½ inches of bare dead femur protruding. The man
was in bad condition and suffering from "chronic sepsis." By the
middle of March, 1916, his general health had much improved and
the stump was in the condition shown in fig. 2. On March 14 the
soft parts were pushed back from the protruding bone and a tubular
sequestrum of the shaft of the femur including its whole thickness and
some eight inches long was withdrawn without difficulty. With the
object of avoiding shortening as much as possible no formal re-amputation
was done, but so much new bone subsequently formed in the stump that yet another operation was required before the wound would heal. This case like the preceding one appears to have been an infected wound of

the knee-joint, but no gangrene was present. Incidentally it is of interest to note that complete separation of a sequestrum consisting of the whole thickness of the shaft of the femur took place in about ten weeks.

In his former paper the writer ventured to suggest that unless special

Fig. 1.—Pte. B. Wound of right knee by rifle bullet, November 9, 1915. Amputation through thigh, December 16, 1915. Drawing done about March 20, 1916, showing unhealed puckered scar.
conditions made it necessary the "flush" method of removing a limb should not be employed, and further experience of the state of the limb stumps after such an operation has tended to confirm the view that the practice should be restricted to cases of absolute necessity. This view is not limited to surgeons working in hospitals at home, but is shared by some at least of those operating at "the Front." It is, however, stated on authority that the results of the "flush" amputation is good and that it is intended that re-amputation should be done by one of the ordinary methods as soon as the wound is sufficiently clean.

Surgeons at home, of course, very rarely see gas gangrene, and if those at "the Front" say that leaving the flaps absolutely open is not sufficient and that a plane section is a life-saving necessity it is no doubt presumptuous to contradict, but the argument does not apply to operations for conditions other than gangrene, such as ordinary septic joints, etc.
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It is in any case very unfortunate that a second operation and further considerable shortening of the limb should be necessary. The amount of this additional shortening needs to be borne in mind by the surgeon who performs the primary operation. In our experience mere shortening of the bone without complete re-amputation does not always result in a satisfactory stump.

Consideration of this question leads to the conclusions:

1. That it is hard for a man to be called upon to have a second amputation.
2. That in some cases the further shortening of the stump may seriously impair the usefulness of the limb (figs. 3 and 3A).
3. That the argument that the freest possible drainage and exposure is required and can only be provided by a “flush” amputation does not apply to cases other than those of “gas gangrene.”

The value of traction upon the soft parts after a “flush” amputation is no doubt great, especially if it is employed early, but it will not in all cases make a good stump but of a bad one. A flap amputation with the flap turned back will, after adjusting the flap a week or more later, make a good stump.

Amputation in Trench Foot.

The question of amputation and re-amputation has been forced upon surgeons at home in patients of a kind quite different from those who have lost limbs as a result of injury.

Men suffering from gangrene due to “trench foot” came over in considerable numbers earlier in the year, and some of them remain in hospital still. In not a few of these the question arises: what is the best course when part or the whole of a foot has been lost and a large raw surface is left?

At first sight it would appear in many of these men that a simple section has been made through the foot or ankle without flaps as in other patients. More careful examination and inquiry—necessary in the absence of any notes—makes it probable that in many instances no operation has been done till the soft tissues have been entirely severed by natural processes and then that the dead part has been removed by simply dividing the bones or disarticulating them at the level of the “line of demarcation.” In some even less than this has been done and portions of the metatarsal or tarsal bones have been left. On the patient’s arrival at home the bones are seen bare and dead on the face of the stump surrounded by a larger or smaller area of granulating or cicatrized soft parts.

It seems that the practice of removing only structures obviously dead is in these conditions the wisest course though a secondary operation must of necessity be performed later. It is wiser to adopt this plan for the following reasons. It is impossible at first to be sure how much of
Fig. 1. "Trench foot." Stumps after detachment of gangrenous parts.
the foot is viable and if any formal operation is done at once either too much or too little may be taken away. It is also likely that the injury necessarily inflicted by operation on tissues the vitality of which is already damaged may lead to destruction of a part of the limb which would otherwise have survived. It is now an only too well known fact that any disturbance of wounded tissues in these patients is apt to be followed by an acute septic process graphically described as a "flare." We may therefore conclude that it is judicious to do as little as possible until the extent of actual complete destruction is determined and the patient's general condition is improved by rest and care.

It is however to be observed that the stumps left under these circumstances are not such as would result from any of the formal operations, and that extensive and irregular scars may remain after healing has taken place.

The rapidity with which the dead parts are thrown off and the speed at which repair takes place in these patients is very remarkable, and sequestra become detached much more quickly than they do in the cases we are used to seeing in civil life. The bones above the line of separation seem to atrophy and become soft and rarefied like the bones in infantile paralysis. This has been very striking in some operations on these cases.

In some instances the extent of destruction of the soft tissues leaves no choice and a formal amputation at a higher level is called for. In others the mere removal of dead tarsal or metatarsal bones will enable the surgeon to provide a fairly satisfactory covering for the stump though such a stump may not strictly follow the lines of any recognized amputation.

It remains to be seen whether the stump left by "trimming" trench feet will be serviceable and stand the strain of wear or whether amputation at a higher level will be required. There has perhaps been hardly time even yet to test this matter by experience, but if a useful foot can be preserved it is clearly better to keep it rather than to sacrifice it for the sake of doing a formal operation.

In some instances a "Syme's" amputation or an amputation with a lateral flap (Boux) gives a good stump, but it appears that if any of the edge of the flap consists of scar tissue this cicatricial part is apt to break down again with very slight cause.

Personally I think it is wiser to wait and test these cases before advising amputation higher up.

It is very hard on the men to have to submit to repeated operations, but in these "trench feet" I fear it cannot always be helped, and since in any case they are not fit for further service a longer detention in hospital is, from a military point of view, of less importance. The drawing fig. 4 shows the condition of the stumps thirteen weeks after removal of the dead parts.

The writer has no wish to criticize the work of others, but while the
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man at "the Front" is and must be the only one to judge in individual cases of immediate and life-saving necessities, those who see the later results of treatment are perhaps called upon to show in what directions any method may require modification.

The cases mentioned are reported with the sanction of Colonel Robinson, C.B., A.M.S., Officer Commanding the Hospital.

The sketches are the work of Cpl. Miller, R.A.M.C.

NOTES ON STABLE MANAGEMENT.

By Temporary Captain HERBERT A. LAKE, M.B., M.R.C.V.S.
Royal Army Medical Corps.

The Royal Army Medical Corps has supplied some of the best horsemen that Great Britain has known. The regular Royal Army Medical Corps officer, too, is generally a sportsman and has a considerable knowledge of horses, especially if he has served abroad. But at the present time many temporary officers find themselves with a horse of whose habits of life they know little, or, perhaps as transport officers of field ambulances, in charge of a number of animals.

It is therefore at the suggestion of Colonel Blackham, the A.D.M.S. of the cavalry division to which I belong, that these few notes are written with a view to helping those officers who have not had previous experience with horses, as grooms and subordinates are often ready to take advantage of a lack of knowledge on the part of the officer.

There is not much to be said about stabling on active service, often one has to be content with the most dilapidated shanty and at times the horse is fortunate if he has even a roof over him. But with a little ingenuity the transport officer can generally make the stable fairly comfortable. The flooring may be improved by draining and laying with ashes or gravel, and though straw or peat moss may be difficult to obtain under service conditions, sawdust, shavings or dried leaves make good substitutes. Although the horse is able to stand for long periods and rests while doing so, as practically all muscular strain is taken from the legs by a stout band—the suspensory ligament—yet he should be encouraged to lie down whenever possible. Improvised screens will keep out bad weather and draughts; but horses standing in unprotected places should be turned back to the wind, a position they always assume if free to take their choice. Projecting nails or hooks must be searched for and removed or knocked flat, as, unnoticed, these may be the cause of severe wounds. Animals inclined to kick or worry others should be either kept apart or separated by logs suspended from the roof.

Feeding.—Before entering into details of feeding, one or two anatomical facts will enable a medical man to understand clearly the principles of horse-feeding.