

16th and 24th hours. The decline in number of metaphases is more gradual than the rise.

2. Repeated injections of colchicine in some patients after a relatively short rest period indicate a possible increased sensitivity to the drug.

3. Biopsies taken 48 to 72 hours after colchicine show an increase in hemorrhage,

leucocytosis and some polyploid cells. Late telophases are occasionally observed in this colchicinized tissue.

4. The evidence presented here suggests the basis for further study of the effect of colchicine combined with other physical or chemical agents in the treatment of human cancer.

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Tantalum Oxide and Wound Healing: Experimental Study.

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Tantalum is a metallic element having an atomic weight of 180.88 and a density of 16.6. It has had some use in surgery, chiefly in the form of plates for substitution in cranial defects. It has been praised as being biologically inert.

Olson¹ reported that tantalum foil placed over wounds from industrial accidents where there had been partial loss of thickness of the skin seemed to produce epithelialization faster than any other method of treatment. It was assumed that this apparent stimulating action was due to the oxide coating of the tantalum which is always present. He then prepared a fine tantalum oxide powder and used it in treating small wounds and burns of the extremities. He reported that the acceleration of healing and the absence of pain were noteworthy. Since his studies did not include controls, we decided to do the following wound healing experiments.

Technic. The technic described by Brush and Lam² was used to test the effect of tantalum oxide powder on wound healing in 47 guinea pigs.

Under ether anesthesia the abdomen was shaved and treated with an antiseptic (hexylchloro-m-cresol). Using sterile scissors, an

oval wound measuring approximately 8 x 10 mm in diameter and going through to subcutaneous tissue was made on each side of the midline. Fig. 1 illustrates the appearance of the wounds immediately after being made.

According to Carrel's law it is unnecessary for the wounds to be exactly similar because wounds in the same individual, even if of different size, tend to heal in the same period of time. The wound on the left of the animal was used to test the tantalum oxide, the right wound being the control. The outline of each wound was traced on sterile cellophane; then the tantalum oxide powder was placed on the left wound, and sterile gauze



FIG. 1.

The appearance of the wounds just after being made.

¹ Olson, C. T., *Industrial Medicine*, 1945, **14**, 949.

² Brush, Brock E., and Lam, Conrad R., *Surgery*, 1942, **12**, 355.

TABLE I.
Healing of Control Wounds Versus Tantalum Oxide
Treated Wounds in Series I (12 animals).
(Dressings changed every 2 days).

Both wounds healed on same day	8 animals
Tantalum oxide treated wounds healed first (one dressing period ahead of control wound)	4 animals
	12

TABLE II.
Days Required for Wound Healing in Series II
(12 animals).
(Wounds dressed on 8th, 12th, 17th, 22nd, 25th and
27th day.)

Healing	Control wound (days)	Tantalum oxide treated wound (days)
Hastened	25	17
	27	17
	22	17
Unchanged	14	14
	12	12
	12	12
	12	12
	17	17
	12	12
Delayed	12	14
	12	14

on the right wound. The tantalum oxide powder was sterilized by heating to 400°F for one hour in a dry oven. The wounds were redressed and measured by tracing every two days. Fresh tantalum powder was applied after each tracing. Table I demonstrates the results in the first series of 12 guinea pigs.

It was then suggested that perhaps the frequent dressing (every 2 days) interfered with the healing rate by pulling off granulation tissue and exposing to infection. We therefore waited 8 to 11 days before changing the first dressing on the remainder of the animals tested. Table II represents a typical experiment on 12 animals (Series 2) showing the number of days required for the

TABLE III.
Comparing the Rate of Healing of Tantalum Oxide
Treated Wounds with Control and with Talc
Treated Wounds (Series III—23 animals).
(Wounds dressed on 7th, 11th, 14th, and 17th days.)

All wounds healed on same day	10 animals
Tantalum oxide wound healed first	5
Talc treated wound healed first	2
Control wound healed first	1
Tantalum oxide wound healed last	3
Talc treated wound healed last	1
Control wound healed last	1
	23

complete healing of each wound.

To determine if the supposed beneficial action of tantalum oxide powder was due only to the drying action of any fine powder, we then modified the experiment to include another wound on the animal's abdomen which was treated with talc. The talc was sterilized in the same manner by heating to 400°F for one hour. Three wounds of equal size were made on the guinea pig's abdomen, avoiding the less vascular midline. The central wound was used as a control, tantalum oxide powder placed in the left wound and talc in the right wound. Again, the first dressing was delayed until the 10th day. Table III sums up the result of healing of the wounds treated in this manner.

In the total number of 47 guinea pigs tested, the tantalum oxide-treated wounds healed first in 12 pigs, the control or talc-treated wounds healed first in 8 pigs, and in the 27 remaining animals there was no appreciable change in rate of healing.

Summary. Small cutaneous defects on the abdomen of guinea pigs were treated with sterile tantalum oxide powder. The healing time of these wounds was compared with that of control wounds dressed with sterile gauze or sterile talc. No consistent acceleration of healing of the tantalum oxide-treated wounds could be demonstrated under the conditions of the experiment.