The use of mechanical tantalum sutures for anastomoses in the lower parts of the colon and rectum has been the subject of an experimental investigation; in some cases a single-row circular mechanical suture, with the apposed edges directed into the lumen of the intestine, was used, and in others this suture was supplemented and buried by a second row of interrupted silk sutures. The anastomoses employed in abdomen and pelvis were of the various types: end-to-end, end-to-side, side-to-end and side-to-side. They were effected with apparatus KTs-28.* In the case of lateral anastomoses the intestinal stump was sutured with apparatus UKL-60, the tantalum suture being buried by a second row of interrupted silk sutures.

Mechanical sutures were used for anastomoses in the rectum in 50 experiments. Radiological examinations were made on 26 experimental dogs, which were kept under observation for 12 months after operation.

Valuable clinical data can be obtained in the first hours and days after operation by roentgenological examination without the use of contrast media when anastomoses are sutured mechanically with tantalum clips. It is recommended that such examinations should be made with portable apparatus brought to the patient's bedside.

Films made in the anteroposterior axis are satisfactory in the case of end-to-end anastomosis, but lateral projections are sometimes better for end-to-side and side-to-side anastomoses. With the patient lying on his back, the cassette is placed on the left side in such a position that the suture should appear in the lower part of the film. The course of the beam is from right to left. The film should be 24 x 30 cm, sometimes larger. These lateral films should provide a good picture of the intestinal slumps as well as of the anastomosis; in anteroposterior films the stumps are often superimposed on the region of the anastomosis, which makes interpretation difficult.

These postoperative radiological examinations will provide information on the state of the suture, the suture material and surrounding tissues. The large intestine will be seen, filed, with natural gas and contents, which will make it possible to determine its diameter above and below the anastomosis, and will provide some idea of the functional state of the intestine.

As the tantalum suture material used in mechanical suture provides some radiological contrast, the anastomosis can be visualized, the early postoperative picture can be studied, any abnormalities detected and their progress observed.

These postoperative roentgenograms generally show a circular or oval anastomosis of the large intestine, ringed by 14 B-shaped clips spaced at equal intervals. The size of the interval may vary with the functional state of the intestine in the region of the anastomosis. When there is spastic contraction in the area, the intervals may appear to be obliterated, but they are gradually restored with the advent of relaxation or stretching.

Separation of the clips was noted in the experimental observations in three cases, but only after 8 or 9 days. Earlier separation was not observed. Separation of the clips tended to occur early in end-to-end anastomoses at low levels, but this is ascribed to the somewhat peculiar nature of the motor function of the rectum. The condition was not regarded as pathological, as the clips were rapidly removed and left no trace.

*The apparatus was devised by S. I. Babkin, G. V. Astaf'ev, and T. V. Kalinina.

The authors attach great importance to these examinations without contrast media in cases of mechanical suture, as the presence of natural gas in the large intestine often reveals the low projection on the inner aspect of the anastomosis which is regarded as normal, "invagination" being thereby ruled out.

Comparison of the diameters of the bowel above and below the anastomosis will afford evidence of the patency of the latter and reveal any pathological signs. Normally, there should be no dilatations or even distension of the bowel above the anastomosis. These early roentgenological examinations will reveal any such disturbances and so indicate the need for appropriate measures.

Pathological signs were observed in only two of the experimental animals, both cases occurring in the period when the prototype apparatus was being tried and operative techniques were being developed. When there was obstruction of the anastomosis, the following sequence of events could be observed. There was increasing distension and stretching of the walls of the large intestine, extending ultimately to the small intestine; later, there was accumulation of fluid, the level of which could be determined with the subject in the vertical position. Violent antiperistaltic movements might cause the clips in the anastomosis and intestinal stump to be discharged into the lumen, one or two being occasionally carried into the upper loop of the anastomosis. Shadows could be observed in the pelvic cavity or in the abdominal cavity when there was associated pelvic or more general peritonitis.

The need for radiological examinations without contrast medium during the first few postoperative days will be determined by the patient's condition and the surgeon's views. The authors are of the opinion that irrigoradioscopy is contraindicated in the early postoperative period. Study of the progress of a barium meal, given 18-24 h previously is a valuable measure in both early and late postoperative periods, as it reveals the state of the anastomosis and the bowel above. The quantity of barium given should be reduced to 15-30 g in the postoperative period. Even if contrast is poor, the region of the anastomosis can be accurately defined from the clearly visible tantalum clips.

Regular barium examinations over a year failed to reveal any anatomical deformities or adhesions. The bowel was freely movable, both