

Malignant tumors ordinarily cause more hæmorrhage than stone; and, further, the constitutional symptoms as well as the signs of enlargement, elicited by palpation per rectum, together with negative results on sounding all point in the same direction.

There is a variety of bladder bleeding which is perhaps, peculiar. For days together, the urine has a dull red color, and is liable at times to contain large quantities of coffee-ground sediment; at any time an extraordinarily violent contraction of the bladder produces a sudden and considerable increase of blood discharge. This is most frequently a complication of papilloma, and the last mentioned feature is produced, it may be presumed, by the undue and forcible compression of the fragile growth by the contracting organ.

The ureter cannot always be distinguished from the kidney as a source of hæmorrhage; and in cases of impacted calculus when the blood might be fairly thought to proceed from this tube, I have not always been able to find the vermiform coagula that are said to form in the ureter.

Perhaps the most common local cause of renal bleeding is calculus, in the pelvis of the kidney; and of such concretions, the urate being the roughest, and the phosphatic the most irregular in contour are productive of most hæmorrhage; but the extent of lesion, size of stone, and amount of bleeding are not always in proportion.

Two of the most instructive cases of hæmaturia I have seen, because they required most patient investigation in order to arrive at a solution of the cause, and in which hæmorrhage was obstinate and extreme, arose solely from that complex condition lithiasis. In both instances repeated attacks occurred, closely resembling a fit of the gravel. Extreme pain was felt along the track of the ureter, strangury and partial suppression of urine, followed by a free urinary flow, well charged with blood, in part fluid and partly coagulated. Soundings were made repeatedly but without discovery of stone. The first urine voided after a subsequent attack was carefully washed, and considerable quantities of fine sharp sand found. Measures were now directed towards the faulty liver, the real cause of the trouble, and with the happy result of a marked amelioration of the symptoms. Such a state of affairs I have found in infants as well as in octogenarians. It may be

asked how could the passage of sand, almost as fine as an impalpable powder, be productive of so much bleeding and pain. The crystals form in the straight kidney tubules occlude them, and are only carried into the pelvis by the *vis a tergo* of the accumulating urine. Consequently as there are possibly hundreds of such sharp crystals the vascular lesions are many, and bleeding being consequently profuse, large clots form, which in traversing the ureter, excite pain, often as excruciating as that due to calculus. I do not think this form of trouble appearing in young infants is sufficiently emphasized; for before I had given the matter some special thought I had seen several cases which I looked upon as varieties of other disorders, a very hazy explanation of which I had to satisfy myself with, but in the light of the pathology of lithiasis they are easily explicable.

That peculiar disease urethral fever, when accompanied by hæmorrhage is worthy, in this place, of special consideration on account of the apparent disproportion between cause and effect. For example the catheter is used dexterously and with antiseptic precautions, for the relief of retention, caused by senile paresis or prostatic hypertrophy; and, although the kidneys have not been found diseased, there may be violent rigors followed by marked constitutional fever, extreme congestion of the renal vessels and profuse escape of blood.

The connection appears to be, that during retention the pressure of the pent up urine supports the distended and attenuated capillaries, and this external support being withdrawn, miliary extravasations occur. An analogous state of affairs not infrequently follows the tapping of a hydrocele or the operation of thoracentesis.

A description of the treatment of hæmaturia would necessarily involve that of all the diseased conditions giving rise to it, and therefore must be omitted with reference to one or two particulars.

1st. In hæmorrhage of renal origin, rest is perhaps the most potent factor in the way of restraint, and with this may be combined the use of such astringent remedies as tincture of iron, the iron alum, mineral waters, sulphuric acid, matico and ergot.

2nd. In case of bladder hæmorrhage instrumental interference is to be avoided as far as possible, lest the irritation excited still further complicate