Thesis

Aneurysm with special reference to Aneurysm of the Abdominal Aorta, with Notes and Comments on a case treated.

by

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The term **Aneurysm** is applied to the dilatation of an artery for a more or less limited extent of its course.

Aneurysms have been classified according to their shape as fusiform and sacculated, according to the entirety of their coats as true or false. A true aneurysm is a dilatation of the artery in which the three coats persist unbroken, a false aneurysm is one in which the inner or the inner and middle coats are destroyed to a greater or lesser extent. In all aneurysms above a certain size the inner coat is found to be destroyed. Hence this is not a good classification.

The classification of fusiform and sacculated is better. A fusiform aneurysm is one where the arterial wall is dilated more or less evenly in its whole circumference for a certain extent, forming a tumour on the vessel pressing evenly in all directions perpendicular to its course. A sacculated aneurysm, on the other hand, is a tumour of varying size which is confined to one or two sides.
Aneurysm -

of the vessel & communicates with it by an opening more or less constricted.

Sacculated  Fusiform.

The term diffused aneurysm has been applied to the subluer formed when a sacculated aneurysm bursts at a prominent point & blood escapes slowly out of it, forming a coagulum, confined by a wall of fibrous tissue, which forms a sort of cyst.

A dissecting aneurysm which is another term used is applied to the condition in which the inner or inner & middle coats of an atheromatous vessel have given way & the blood has forced its way between them & the outer coat.

Clinically, therefore, the most important classification is:

- Fusiform
- Sacculated
- Dissecting - O'Leary.
Causes of Anurygus

are predisposing or exciting.

An anurygus usually occurs during
a sudden strain or exertion in
a person whose vessel walls are
weakened at a certain point e.g.
from atheroma or other cause. At
this point the vessel wall being weak
stretches so we get the rudiments
of an anurygus formed which gets
larger and larger with every subsequent
strain or excitement, some of the
vessel coats giving way.

The exciting cause of anurygus is
therefore some sudden strain e.g.
lifting a very heavy weight, running
to catch a train, a stunt at the
end of a race etc.

The predisposing causes are
anything which weaken the walls
of the blood vessels. The commonest
is atheroma in the larger vessels
and in the smaller vessels e.g. strain, an
embolus, a tubercle becoming fixed in
a vessel cause an anurygus to form
by weakening the walls at that point.

Syphilis, if acquired variety, is said
to be the most important predisposing
cause. Some observers go so far
as to say that in every case of aneurysm there is a personal or hereditary history of syphilis. (I cannot recollect to find my authority for this) Undoubtedly in a large majority of cases there is a history of syphilis but I don't think we can go so far as to say in all. Excessive muscular strain acting over a long period is a great predisposing cause by weakening the walls of the vessels. In the great majority of cases aneurysm occurs in soldiers who have to undergo a great deal of fatigue, exercise, marches etc. or in those who work hard or enjoy themselves hard e.g. athletes, footballers etc.

Aneurysms are much more liable to occur in men than in women because of men leading harder lives & being much more subject to have a continuous hard work than women. The proportion is said to be seven in men to one in women. They may occur at any age but are rare in young people. The commonest age is thirty to fifty years.
The Symptoms of Aneurysm must necessarily vary with the site in the small intimal aneurysms of the brain which are the result of embolism or kidney disease. You get the symptoms of embolism viz., headache, giddiness, impairment of memory, perhaps abnormal subjective sensations, but it is the larger aneurysms we have to consider most especially. As stated above the symptoms must vary with the site but I may mention the symptoms common to all:

1. Tumour, or lump which is always present but not always recognizable when deep-seated e.g. early thoracic aneurysm or aneurysm of intestinal side.

2. Pulsation — may not be felt if deep-seated; when felt it has a peculiar heaving character, termed expansile. By placing two stethoscopes side by side on the tumour as parallel as possible, their distal ends are kept to separate with the systole of the heart & to approximate with its diastole. This is due to the expansile character of the pulsation. The pulsation may be absent altogether or nearly
If there is much coagulum in the tunce or if the aneuerym is leading to a spontaneous cure, it is always present and is due to the blood passing from a smaller tube into a larger chamber suddenly. It may be harsh or loud or soft or blowing in character, but is generally inclined to be harsh and loud. It is possible that with a feeble blood current or with much coagulum in the sac the murmur may be absent.

4. Pain is frequently present and is due to pressure or stretching of neighboring structures. It often radiates along the nerves from the point of pressure e.g. along intercostals. It is much more marked when the aneurysm is deep seated or in dense tissue because the nerves are then put more on the stretch as there is less room for the tissues to give way. Shew in a large cavity e.g. abdomen or when superficial.

5. Other effects of pressure are to be noticed e.g. we might get sickness...
Aneurysm - Symptoms of

from pressure on stomach or the sympathetic nerves. When aneurysm is on the cerebral arteries we get fits of dizziness, faintness etc.
Pressure on the brain or on nerves elsewhere might lead to paresis or paralysis;
by when an aneurysm is unilateral that not on the main vessel of the body, there is a difference to be noted in the state of the distal pulse on the two sides of the body which will help one in coming to a correct diagnosis.

Results of Aneurysm or what may happen to it:

1. A spontaneous cure may result in the sacculated form by the deposit of fibrin in the sac, which gradually fills up, becomes fibrous tissue & the aneurysm is obliterated. This is said not to occur in the fusiform variety because it lies in the direct blood current. In the sacculated which does not lie directly in the current but on its side as it were the case evidently occur.
2. Pressure on surrounding parts.
This is very marked in some places
i.e. chest pressure on larynx causing
asphyxia or on lung causing dysphonia.
In the chest aneurysms have been
seen to eat through the breast bone
and appear as pulsating tumours
projecting on the front of the
sternum. Pain is generally the
result of pressure.
Aneurysms
when situated near the vertebral
column (e.g. on aorta) may eat
into the vertebrae. It is a curious
fact that cartilage is more
resistant than bone and after death
in the case of an aneurysm which
has eaten into the vertebral column
the intervertebral discs may be
seen projecting between the
adjacent constricted vertebrae.
3. Haemorrhage. This is very
liable to occur as the wall
of the sac gets thinner.
The extent and rapidity depends on the
support from without and on the size
of the aneurysm. Death is quicker
when the haemorrhage occurs in the
hollow viscera (e.g. abdomen) may
occur in minutes because of the
abscence of support. In fibrous tissue the haemorrhage is slower & it may be simply an ooze which goes on for a time & may stop for the present from a diffuse aneurysm so may slowly tend to a fatal termination. In the extremities there may be tense for treatment & the haemorrhage may be stopped entirely.

The prognosis depends on the size of the aneurysm & whether it is amenable to treatment or not — also on the size of the artery & the nature of it & the time it has been known to exist.

Aneurysms of the extremities can be treated by proximal or distal ligation, by electrocoagulation, or the introduction of thin needles (Macleod of Glasgow) or by amputation. They are therefore curable, & hence the prognosis here is good. As a general rule the larger the artery affected the greater is the danger of a fatal result i.e. the danger is greater where the pressure from within is greater & the nearer the heart.
An aneurysm of the aortic arch or aorta, for example, would tend to rupture or cause fatal pressure symptoms sooner than an aneurysm of the Popliteal which might be treated.

It is impossible to tell exactly how long an aneurysm will persist without rupture or other fatal result. At any time if not treated surgically a rupture may occur resulting in death, or pressure symptoms may develop gradually or other complications. An aneurysm of Cerebral artery may rupture at any time and give rise to cerebral haemorrhage or Apoplexy.

The Diagnosis is easy if the aneurysm is not deepseated and is based on the symptoms already mentioned viz., tumour, expansile pulsation, murmur, pain, pressure effects, according to the size and site. For example an aneurysm of the Popliteal is easily recognized as all that has to be kept in mind is not to confound it with a tumour over the artery or a vascular tumour e.g., Sarcoma.
A vascular tumour i.e. a sarcoma is sometimes liable to be mistaken for an aneurysm. You then consider the general history & condition of the patient, age etc. & paying special attention to the state of the circulatory system. A tumour may be present due to the pressure of a tumour on the artery & the pulsation may be palpable if the vessel is in the centre of the tumour which is not an aneurysm. Palpate the tumour carefully, note its density, examine the pulses & you will arrive at a right conclusion.

A gluteal aneurysm is liable to be mistaken for a sarcoma, because it is deep seated & a sarcoma is very vascular, but on carefully feeling the tumour & going into the history, you eliminate the latter condition also helps you. Knowing that the lump is in the course of the gluteal, the chances are in favour of its being an aneurysm. I saw a case of gluteal aneurysm correctly diagnosed in St. John's Royal Infirmary some years ago & treated by Ectoplasia (Dr. Jem Duncanes method) & cured.
If the tumour is deep seated, e.g. in the chest or brain, you can only form your conclusions on general principles considering all the pros and cons of the case.

The treatment of an aneurysm when diagnosed may be a surgical or local, by medical or constitutional means.

The surgical treatment can only be applied with safety to vessels at a distance from the heart. The further an aneurysm is from the heart the more you ought to attempt its treatment surgically.

This treatment consists of:

1. Proximal ligature
2. Distal ligature
3. Proximal + Distal Ligature
4. Digital Occlusion + Electrolysis
5. Introduction of aseptic needles into the sac, according to the McEwan of Glasgow.
6. Pressure over the tumour or above and below it, applied for a certain time.
7. Injection of fresh or dry marc for horse or other coagulating agents into the sac, and manipulation of the sac.
externally have been recommended. I simply mention the modes of treatment, surgically, which are well known - it is evident that one could not apply a ligature to the aorta, except under very special circumstances, although one might + ought to in the case of aneurysm of external iliac or femoral. Neither could one attempt electrolysis in aortic aneurysm, although one might + could in case of popliteal.

Proximal + distal pressure has been applied to the abdominal aorta for aneurysm + cases are reported which were cured. I will consider this more in detail under abdominal aneurysm later. Amputation of the arm has been performed for aneurysm of substance with satisfactory results. The medical treatment may be summed up + ie.

1. Rest
2. Restricted diet
3. Anodynes + sedatives
4. Fodide of Potassium

This treatment is applicable but with variable results as matter where the aneurysm is situated + cases are
Aneurysm—Treatment of

Reported case of aneurysm of the aorta.

1. Rest. Perfect rest is essential if the aneurysm is of any size or if a cure is aimed at. The patient ought to be put to bed and not allowed even to sit up or be kept there until all signs of pulsation have disappeared from the aneurysm or until the vessel pulsates at that spot in the normal manner and the tumour has gone down by thickening of the vessel wall. excitement of every kind must be avoided. He must not be allowed to speak for too long at a time or one must suddenly frighten him. A bed pan ought to be used for the evacuation of the bowels bladder. He must not be allowed to read too much or what he does read must be light literature. The best way is for some one to read to him. In bad cases some one ought to feed the patient also. In this way perfect rest physically and mentally will be obtained.

2. Restricted Diet

This is very important and ought
when possible to consist of a larger proportion of solid than liquid food so as to lower blood pressure & keep it low. The patient ought to get simply enough food to keep him young, short of starvation for a time. With this treatment the blood current tends to flow slowly through the aneurysm & there's deposit of fibrous tissue likely to take place which will gradually strengthen the walls at that point & may lead to the complete obliteration of the tumour & its replacement by fibrous tissue by degrees.

The well-known method of Taffnell is said to give good results. It consists in restricting the diet to the following:

- For breakfast: two ounces of bread & butter and two ounces of new milk
- For dinner: two or three ounces each of bread & meat, with from two to four ounces of milk or claret
- For tea: the same as for breakfast.

This method of Taffnell may be tried & may prove of great service. The principle of restricted diet is
Very important & ought to be carried out where possible with modifications according to the requirements of the case.

3) Should pain come on or restlessness or the nerves be upset analgesics e.g. opium & sedatives e.g. Potassium bromide should be administered. I have found bromide of potassium very serviceable to relieve & sleeplessness.

Sleep if interfered with must be induced by bromide, chloral or other sedative.

Potassium iodide appears to be the only drug which when administered internally seems to have a specific action on the aneurysm. It is supposed to act by slowing the heart, lowering blood pressure & promoting coagulation.

Some observers recommend its administration in large doses e.g. 20, 30 or 40 grains three daily.

Cases have been reported even in acute aneurysm from its administration thus: In the Edinburgh Medical Journal for July 1869 Dr. G.W. Balfour records cases & advises the administration of
two grains of Potassium Iodide for
drum and in some of his cases he
continued this for a year with
very marked benefit.
Dr. W. Roberts of Manchester advocates
large doses given over a long period.
Other observers recommend smaller doses
to be given over a longer period.
Dr. F. W. Balfour writing in the
British medical journal 9 June 6th
1891, (p. 1221) seems to have modified
somewhat his former views. He states,
"To obtain improvement (in Aneurine of
the Aorta) it is not necessary to give
large doses of Potassium Iodide but
we must give enough. Put the
patient recumbent for two days or so
and begin with 3 grains of Potash
Iodide in a bitter infusion of Chiretha
every 8 hours. This is continued for
two or three days, the pulse rate
being taken daily at the same hour.
After two or three days the dose of
Iodide is raised to 10 grains every
8 hours for three or four days, the
pulse rate being taken in the same
way. In this way the dose
may be gradually increased
until a dose is reached under
which the pulse rate is found to rise, then we must stop the medicine for a day & go back to the previous dose. The moment the pulse rate rises, the benefit ceases & the constitution begins to suffer. Seldom is it necessary to raise the dose above 10 grains every 8 hours & commonly 5 grains is quite sufficient. The maximum of benefit is obtained by a dose just below that which lowers the blood pressure so far as to cause the pulse rate to rise. Two or at most three weeks is quite long enough to continue the remedy every 8 hours afterwards it is sufficient to administer it every 12 hours & continue it from three to six months to put the patient in a very comfortable position. The length of time the remedy has to be employed depends very much upon the size of the aneurysm when the treatment is commenced. These views of Dr. Balfour are well worthy of promulgation & I am inclined from what little I have seen to favour the
administration of Pot. Iodidi in small doses given over a long period, starting e.g. with 1/125 to 1/3 three daily, and going up gradually to 1/10 three daily, administering this dose for a considerable time, say 3 to 12 months, occasionally leaving off for a week or two according to the state of the patient. The value of this method is seen in cases of sickness and disordered digestion where the patient's stomach cannot stand a dose of 20 grains where it cannot be brought down gradually to bear this dose.

Undoubtedly Pot. Iodidi is of great value in Anemiesia, in some cases probably when given in large doses over a shorter period in others probably when given in smaller doses over a longer period & we have supporters of both methods.

5. The general symptoms of the patient must be looked for e.g. faintness may be overcome by a little brandy of Champagne or a diffusible stimulant. Stimulants where possible ought to be avoided. The tone of the system must be
kept up if necessary by iron, quinine &c.

Digitalis is recommended by some but I have found it inclined to cause great restlessness & to upset the circulation entirely & I will be very chary of using it again. By stimulating the heart & raising the blood pressure I should be inclined to think it would be more likely to do harm than good. The case in which I gave it was one where the aneurysm had not been recognized.

A little blood may be removed from time to time, with advantage in some cases of aneurysm, but the induction of anemia should be carefully avoided. (From "A Treatise on Medicine," page 542, 2nd Edition.)

Among medicinal agents in addition to those mentioned—Acetate, Belladonna, Galls & Tannic Acids, Scurvy, & Acetate of Lead—have been recommended but the only drug which has really been proved to be of value is Potassium Iodide.

So much for Aneurysm generally but I wish to consider more
especially aneurysm of the abdominal aorta & to give the
not of a case which has been
under my care for over a year &
which has very remarkably improved.
& to make a few practical observations
on it.

By aneurysm of the abdominal aorta
we mean an aneurysm occurring on
the aorta between the spot where it
passes into the abdomen through
the diaphragm, in front of the body
of the last dorsal vertebra (Dudins Anatomy)
& its division into the two common
terms on the left side of the body of
the fourth lumbar vertebra (Gray's Anatomy)

The causes of aneurysm here are
those of aneurysm generally. They
have been already considered viz. Syphilis,
mechanical strain etc. It is commonest
here in middle age & is much
commoner in males than females (761)
Pathologically its usual site is found
to be between the diaphragm & the
origin of the superior mesenteric &
it often involves the origin of the
celiac axis unless it may
occur anywhere in the course of
the vessel. The branches of the
Vessel are as frequently affected as the vessels itself, the Commonest is the Hepatic - the Coeliac Arteries, the Mesentric & Renal are the next in frequency.

In growing it may interfere with adjacent organs & Structures. By considering more definitely the relations of the Abdominal Aorta, we will see the structures upon Aneurysms here will be liable to interfere with. As stated already, the abdominal aorta starts at the opening in the diaphragm opposite the last dorsal vertebra & descends in the abdomen lying a little to the left of the vertebral column & ends on the left side of the body of the fourth lumbar vertebra. It is course forwards lying on the vertebrae, its greatest mobility being opposite the third lumbar vertebra which is a little above & to the left of the umbilicus (Gray Anatomy).

The relations are from above downwards Anteriorly - the Lesser Omentum & stomach, behind which are branches of the Coeliac Arteries & Solar plexuses, below these are the Splenic vein, the Pancreas.
Aneurysm of Abdominal Aorta

the left renal vein, the transverse portion of the duodenum, the pancreas, and the aortic plexus.

Posteriorly, between it and the lumbar vertebrae are the left renal veins, the receptaculum chyli, and the thoracic duct on its right side, inferior vena cava (the right crus of the diaphragm being interposed above) the vena cava, the thoracic duct, and the left semilunar ganglion.

On its left side, the sympathetic nerve and the left semilunar ganglion.

An aneurysm of the abdominal aorta might interfere to a greater or lesser extent with all or any of these structures. It might get disturbance of digestion, sickness, constipation, pain, droopy and numerous other symptoms as a result. E.g., pressure on the celiac axis and its sympathetic plexus might lead to indigestion and constipation; pressure on or interference with the solar plexus might lead to pain, constipation, or great nervousness. Pressure on the renal vein might give rise to albuminuria, and on pancreas, weight aid indigestion and constipation, &c., &c.
Whatever be the function of the structure pressed upon, that will be interfered with to a greater or lesser extent, and therefore numerous secondary symptoms may arise. Pressure on the vena cava will cause oedema and albuminuria. Pressing backwards the aneurism may brode the vertebral or by pressing on the spinal chord lead to paralysis of the legs and may be incontinence of urine or feces. Pressure on the renal plexuses may interfere with the urine and passage. The symptoms of aneurism of the abdominal aorta are those of aneurism generally viz., tumour, pulsation, murmurs with pain. Pressure. Symptoms may be with special modifications owing to the site of the tumour. The patient comes to you complaining perhaps of feeling faint or giddy at times, breathless on exertion or on climbing a hill, loss of appetite, may the constipation, tingling in the legs or body, flushes of heat or palpitation. Perhaps or may be simply feeling vaguely ill with no definite symptoms. You examine the heart and chest and find nothing abnormal unless perhaps an
acceleration of the heart's action, pulses radial equal on both sides.

History - The patient says perhaps that he has been a soldier or a sailor or an athlete & has been used to hard work & lifting heavy weights. His age is between 40 & 55 years perhaps. He may have had syphilis years ago today or may not have some of its sequela now. He tells you that one day about a month ago or longer he felt something give way in his side on lifting a heavy weight & that he got quite dizzy & faint had to go & lie down & he states that he has not been the same man since. He may say that at times he feels a fluttering in his left side & breathlessness. He may complain of pain in the stomach or elsewhere. The pain may be very severe & of a nervous paroxysmal character may radiate to the groin or back or other side. It may be in the line of certain nerves.

You then get him to undress & proceed to examine him carefully in the usual way. In examination you find the heart & lungs normal & there
You proceed to examine the abdomen. Through it you perhaps see a pulsation in the line of the aorta, generally in the epigastrium, in the middle line or a little to the left of the middle line. It may form a distinct lump at one point which may be larger or smaller but is evidently pulsating. On palpation the lump is felt. You can define it distinctly by moving your hands about and feel it pulsating. The pulsation is felt to be of a heaving character, the vessel seeming to expand equally in all directions, not forwards only. This is the palpable pulsation. You may feel a thrill as the blood circulates round the sac but not necessarily. The pulsation felt is synchronous with the systole of the heart.

On percussion you find an area in the abdomen over this pulsating lump quite dull on percussion or relatively dull to what it normally ought to be—not tympanitic. This dullness varies in extent. It may extend from epigastrium into the left hypochondrium or umbilical region.
On auscultation over this area you will probably hear a murmur, soft & blowing at first, loud in character & lasting. This murmur can be heard probably extending above & below the tumour & gradually fades away until it disappears entirely, being definitely limited to the tumour & its vicinity. This murmur is synchronous with the systole of the heart. Some say a diastolic murmur may be heard, but this is very rare & some great observers say that it is never heard (R. T. Roberts, Theory & Practice of Medicine). It is practically speaking never heard. Two stethoscopes applied side by side give the characteristic test for expansile pulsation as explained under Aneurysm generally. On auscultating the corresponding area on the back, a murmur may be heard over a fixed extent of surface or may be absent. This tumour which you have felt & examined is occasionally movable & influenced by the position of the patient. If the patient is made to kneel on the bed & put his elbows on the bed as well, the impulse does
not disappear & the murmur can still be heard.

There is no relation between the size of the aneurysm & the degree of pulsation or loudness of murmur. Pressure signs may be present in the case on inquiry or examination although in the abdomen those signs other than pain are not common because the organs tend to yield to the growth. In some cases you find the digestion out of order in others obstinate constipation is the only prominent symptom. There may be dropsy of legs & abdomen; on examination of water albumenuria. Paralysis may be present in advanced cases. Incontinence of urine & feces. Vomiting is sometimes a prominent symptom from pressure on sympathetic, color of stomach.

The Differential Diagnosis.

This is important: you must not, if possible, confound a case of abdominal aortic aneurysm with anything else. The Conditions you are most liable to mistake it for...
Aneurysm of Abdominal Aorta

Diagnosis

are:

1. Simple Aortic Pulsation
2. The Pancreas or a solid tumour transmitting the impulse from the aorta or giving rise to a murmur by presence of the aorta or consequent constriction
3. Fluid accumulation e.g. hepatic abscess or hydatid tumour.

Consider carefully the history, symptoms and physical signs of the case, especially the presence of expansile pulsation or murmur in line of aorta, and there will be little difficulty in arriving at a correct diagnosis. If you are in doubt watch the case for days or weeks and even in cases where there is no visible tumour, only general vague symptoms, you will arrive at a very likely diagnosis.
Aneurysm of Abdominal Aorta

Diagnosis

hand, workers, athletes. It can only be markedly felt in very thin persons, e.g., there are no signs of pressure on surrounding structures, no tenderness on pressure.

d. The pulsation is not expansile, the impulse being forward, not lateral, there is never a thrill nor increased dullness on percussion.

e. If murmurs are present, it is soft & blowing or whiffing in character, never harsh or loud.

Solid Tumour over aorta is diagnosed from aneurysm by its mobility & by the pulsation not being expansile, by the absence of blast, & by the absence of blasts. Other symptoms of aneurysm. The diagnosis is sometimes impossible for a time if tumour fixed to aorta pulsating with it especially if aorta passes through it.

Staphylococcus or staphylococcal abscess. The diagnosis from these is on the same general principles & the application of our knowledge of the symptoms, signs of abdominal aneurysm. Frequently in cases of aneurysm, the patient looks well, their general condition is satisfactory. Sometimes...
they have a very peculiar aspect indicating profound illness with
anaemia even when there are no
distinct physical signs of aneurysm
& after death in cases of this sort
deep-seated aneurysms are found.
In the latter case the diagnosis is
hard but the probability of aneurysm
has to be considered

**Prognosis of Aneurysm of Abdominal Aorta**

This has to be considered, whether the
patient will recover or not & in how long.
As a rule aneurysms here are fatal
within a few years if not treated &
even then may end in death at
any time while under treatment.
The value of treatment is very
questionable so that aneurysm here
is a very grave thing. Cases of
cure are reported by administration
of Potassicum Solide & by pressure.

An aneurysm when not treated tends
to grow & its walls get thinner &
thinner due to their being stretched
by pressure of the blood current the
more the heart the greater is this
danger. Death usually results
from rupture into the retro-peritoneal
tissue, into the peritoneum or into
Aneurysm of Abdominal Aorta

Prognosis - Treatment

one of the hollow viscera or from exhaustion from pain, sleeplessness, sickness or malnutrition.

Treatment. The general principles are the same as for aneurysm elsewhere and are named under aneurysm, but there are special modifications owing to the site.

Internodal and distal ligature are inapplicable owing to the large size of the vessel.

Pressure above below the tumour has been attempted by some observers with a cure resulting.

Salvino puncture and Ewan's forceps or needles have been tried.

W. Ewan of Glasgow (in the Lancet of Nov. 22nd, 1890) has advocated the induction of white thrombi in aneurysm of the large vessels including the abdominal aorta, by the introduction of sterile acetic needles into the sac at different points & scratching the wall by moving the point of the needle about or by leaving the needles in the sac for some time & allowing the blood as it circulates to move around. In this way thrombi are
Aneurysm of Abdominal Aorta

Treatment

Deposited at these points by tenuous formation lead to a thickening of the arterial wall and shunting of the sac, the blood still circulating through the centre of the aneurysm. The needles may have to be introduced at several different points, and ought not to be left in for more than 48 hours.

The wall of the sac ought to be injected methodically and evenly all over lest it burst at an unprotected point. In inserting the pair of needles, care ought to be taken not to injure other important structures. Dr. McClellan reports one case of aneurysm of the abdominal aorta treated with good results in same article (Lancet, Nov. 23, 1890).

The rapid pressure treatment of Dr. Wm. Murray of Newcastle on Tyne seems meritorious. This plan consists in keeping the patient well under chloroform and applying a tourniquet over the aorta above the tumour and maintaining steady and constant pressure by means of it until all pulsation has ceased in the aneurysm on removal of the tourniquet. The blood coagulates in the sac and obliterates it. Collateral circulation is set up.
The results of this treatment are such that it may be tried in appropriate cases if other measures are not followed by good results. Before attempting it many things would have to be considered especially the constitution of the patient. It ought not to be attempted in weakly patients as the shock to the system of stopping the circulation through such a large vessel as the aorta might be fatal. It ought not to be attempted in anyone with a weak heart or with kidney disease. The site of the aneurysm would have to be fairly low down on the aorta so that pressure could be applied above it & it would evidently be impossible if aneurysms were high in the epigastrium.

If the aneurysm is high use arterial pressure applied on the same principles would perhaps be of service might be tried but the nearer to the heart & the force of the circulation would probably be such that on the removal of the pressure the blood would go on circulating as before.
Aneurysm of Abdominal Aorta
Treatment

and no coagulation occurs in the sac there would also be the danger of the aneurysmal sac bursting during
the application of the pressure. From the increased pressure at its due to
the blocking of the vessel beyond. Hence, if one Murray's plan & distal
pressure might be attended with very
grave results.

I think in aneurysm of Abdominal Aorta
the only safe method established up
to the present time is the treatment
constantly by Potassium Iodate,
rest & diet. Sutnell's method of
diuring as already described is of
service in some cases.

Pain from pressure may call for the
subcutaneous injection of morphia &
may be considerably relieved by changing
the posture of the patient in some cases.

Bowel ought to be kept regular by
mild aperients.
The best treatment to adopt would be I think to order the patient to
bed as soon as abdominal aneurysm
is diagnosed. Any symptoms such
as pain ought to be relieved by sedatives.
If the patient is in poor health to
all appearances except for the
aneurysm but Saffnells method of dieting may be tried. The bowels ought to be kept open every third day with regularity by a mild purgative, such as castor oil or by an enema. If the patient is faint a little weak brandy, wine or a little spirits in this case may be given occasionally. A good night's rest ought to be insured by the administration of Potassium Bromide. Sufficient given at bed time & if necessary Potassium Bromide may be given in the day time as well occasionally to avoid restlessness.

As a specific for the aneurism Potassium Iodide ought to be given three or four times daily. Some, as I have already said advise 20, 30 or 40 grains three daily for two or three weeks but I think 5 to 10 grains three daily over a long period, several months, answers better.

In this way if you do not cure the aneurism the circulation becomes much calmer & the patient is made comparatively comfortable. The effects of the Iodide must be watched & it should be stopped
Should symptoms of Indisern develop & should the pulse become of very low tension & rapid, when the pulse again gets slower & stronger the iodide must be continued again for a time & stopped when the same symptoms recur. In this way the tumour will gradually improve & may in a year or two disappear.

If the patient has Indigestion or is very much run down it may not be advisable to stick to Saffell's diet & New beef tea, milk, Valentine's meat juice & Brains jelly will be found serviceable in moderate quantity.

I don't think in an aneurysm in this situation it is advisable to go in for too much starvation. Some people believe in a moderately generous diet & in keeping up the system & this is what I have found of service.

After trying fast diet & Potassium iodide for a reasonable time, then if you are not satisfied you may resort to some of the operative measures if you think fit.

In a fistiform aneurysm all that can be hoped for is alleviation of the symptoms - i.e. a saluted a cure.
Aneurysm of Abdominal Aorta

Treatment may occur in some cases but probably in the majority of the cases alleviation of the symptoms strengthening the walls of the aneurysm is the most that can be hoped for and this is best attained by rest, Potassium Iodide, diet and treatment of symptoms.

I will now give the notes of a case of aneurysm of the abdominal aorta which has been attended to for over a year which illustrates the obscurity of the symptoms of aneurysm, represents a few interesting symptoms and shows the value of the above treatment.

Mrs C., aged 40, was sent down to the surgery on Feb 13th 1895 for me to go up to the house see her. On arriving I found her in bed.

General Appearance - She was a tall thin, pale, rather nervous looking woman complained of excruciating pain at the back of the head in the region of the external occipital protuberance. The pain was of a throbbing character & she stated that light irritated her eyes made the pain in her head worse, also moving or trying to sit up.
Now trying to sit up she said a funny feeling came over her that she felt faint but the predominating symptom was headache. She stated that she had suffered from indigestion for years was habitually constipated but was lately very much more so than usual. She said she had been bad for about a fortnight with the headache but had not felt well for months. I examined her heart & lungs found nothing abnormal there so I ascribed the headache to cerebral congestion from constipation. Pulse 120, Temperature 100.

I ordered her a dose of salts for the constipation & ordered the rooms to be kept dark & no visitors to be admitted. I told her to stay in bed on a light diet of boiled beef tea & prescribed her a mixture containing Promulce (Bicarbonate of Bicarbonate). She said she had not slept well for weeks so I thought promulce would be of value.

Feb 14th I found her a little better.

Temp. 99.5° Pulse 100. She had not had a good night therefore I prescribed gr. 20 of Sulphur to be taken at night in addition to the promulce mixture.

Feb 15th she had slept better but head
Notes on Case.

was still painful therefore I increased
dose of bromide to 17 every 4 hours.

Temperature normal. Pulse 80.

Feb 16th

Read a little better, had a better night.

Feb 17th

Pain had now left the back of the
head as was felt more in the forehead,
& at the roots of the eyes, so I applied
blistering fluid to the left temple.

Feb 18th

Pain had gone from the left side
of the forehead & the left eye so I
applied a blister to the right temple.

Today she stated that she felt
much better but very weak & useless.
As pain was better I thought I
would prescribe a tonic of arsenic.

Feb 26th

I did not see her yesterday. Today,
his headache had entirely gone but
she felt very weak & helpless still &
was trying to sit up felt naturally
quickly faint & had to lie down again.
She complained of being very constipated
again so I advised her to take
chills containing cascara sagrada at
night.
Feb 22nd

About the same, but had to take salt in the morning after taking cascara pills the night before, before she had a motion. She got up yesterday for a short time but a peculiar giddy feeling came over her, she fainted. She felt better on lying flat on her back after taking a little brandy. Therefore I told her not to attempt to get out of bed again at present & prescribed a mixture containing 5 grains of digitalis to be taken thrice daily in addition to the iron + arsenic causing the faintness & giddiness to weakness alone.

Feb 24th

I was sent for to see her, found her no better, the bowels being very bound & not influenced in any way by the cascara pills. She complained also of a sinking feeling in the feet of the stomach & a fluttering at the heart, the feeling of a hot & palpitation. Her pulse was full bounding probably from the administration of Digitalis. I examined the heart again & found nothing organically wrong, therefore I
became suspicious of some undiagnosed condition examined her abdomen carefully & discovered there a pulsating tumour in the epigastrum in the course of the aorta, a little to the left of the middle line & extending downwards to a little below the umbilicus (on palpation & percussion) on inspection a pulsation can be distinctly seen in the epigastrum to the left of the middle line, a little above the umbilicus.

On palpation a tumour can be felt beneath the pulsation, which is felt to have a distinct voluminous expansile pulsation & seems to push against the hand in all directions. This tumour can be defined above & below & seems to merge into the aorta in both directions & forms a fixed area extending above it to the left of the umbilicus being most prominent where the pulsation is visible.

On percussion there is dullness over the same area, almost complete over the centre of the tumour & less dull at the periphery.

On auscultation there is a distinct systolic murmur to be heard over
the tumour fading away above it. It cannot be heard high up in the epigastrium nor above the xiphoid, but below the umbilicus. No murmur at all to be heard over the areas of the heart.

Constipation, I have mentioned as a prominent symptom. The flutterings at the heart & giddiness.

Previous History. She had suffered from indigestion for years. Had appendicectomy five years ago. She has just had rheumatic fever, although she suffers from rheumatism in the joints & several are thickened by arthritis. She states that about a year ago she was hanging out clothes on a line, when in straining a little to put on a peg, she felt something give in her side & felt suddenly faint. Had to be carried into the house & laid on a sofa - brought round by stimulants. She was confined to the house & sofa for a week or so after this but had no medical advice. Since this time she had not felt well & got quite breathless on exertion. She also states that about two months ago, she went to a dance & on retiring to
dance felt something give way again in her side, felt faint & giddy & had to be laid down & afterwards taken some. She felt better in a week or so.

**Diagnosis** - Here we had a fairly definite of two strains. She had not been a very great worker, her husband (a gamekeeper) being fairly well off, but had performed the ordinary household duties all his life. She has one daughter aged twenty years or so. She had inflammation of the large bowels (she says) for six weeks years ago. I came to the conclusion that she had a **sacculated aneurysm** of the abdominal aorta & fairly large size & by the physical signs it probably involves the aorta & origin of renal & inferior mesenteric arteries with the plethora of sympathetic in that region.

**Feb 24th**

On diagnosing aneurysm I decided to put her on Potassium Iodide as soon as I could but for the present contented myself with keeping her in bed & trying to get the stomach &
Holes on Case

Bowel not in order so I prescribed a
mixture containing

1. May Carbon 3f
Sod. Bicarb 3f

3f Ammonia Co aq

My thu father 3f aq

with a light diet consisting of milk &
Beef Tea because solid food causes griping & sickness

Feb 26th

Was fairly well
Put her on a diet of milk,
Valentines Meat Juice & Brand's
Jelly given alternately as her
Stomach was not in a fit state
to stand solid food & I therefore
could not give her Saffron Diet.

Mar 1st

She said she felt very comfortable
Pulse calmer so.

Mar 3rd

Still has a feeling of great weakness,
Constipation very troublesome & she
does not care about an enema.
Mar 7th

Constipation troublesome therefore
I prescribed a mixture containing Pulvis
Sod. Bicarb. To have one to be taken three
daily with Pil Alumini Co. one to be taken
at night to try overcome the constipation.

Mar 12th

She had been horribly griped since she had been taking the Rhei pills had most excruciating pain. Bowels had not been opened, she had to take an ounce of salts before she had them moved. Therefore I stopped the Rhei mixture & gave her simply a mixture containing Sod. Bicarb, @f. Chloriaceo, Inf. Calomel, along with the Pil Albumi Co as before.

Mar 16th

Still very costive & griped therefore I stopped the Pil Albumi Co & prescribed Colocynth cum Cepaeicum pills to be taken at night when necessary. She was seen today in consultation by Dr. H who advised the pills containing Colocynth, Rhoisaff. & Cepaeicum to be given.

Mar 20th

The Colocynth pills acting thankfully after the first time, she not so well afterwards. She is taking two of them every other night.

Mar 25th

I thought I ought to try a heat...
Hanks on Case

Anurereau more especially prescribed a mixture containing 5 grains of Pot. iodide to be taken three daily & another mixture containing 15 grains of Pot. Iodide to be taken when restless & continued the polynymia pills at night followed by a little salt in warm water or the following morning, as the effect was bad without.

Mar 27th

I was sent for to see her. She had had tremendous attacks of retching & sickness with palpitation of faintness. Everything she took coming up. Menstruation had come on & she was losing blood pretty freely. Therefore put her on a diet of milk & soda alone. Stopped the Potassium Iodide for the present & gave her simply a mixture containing 20 grains of Caffeine. Slight effect taken every 36 & hours.

Mar 28th

Sickness better. Home since yesterday had a fair night.

Apr 1st

Better. Menses over. Ordered an enema of warm water & soaps to be given every 3rd day regularly to have
The bowels & all opening medicines & pills to be stopped. I ordered her to go on at present with the
bismuth as she was still slightly sick at times. I painted tturine
iodo on the auricula & ordered it to be done every other day for a time
Apr 7th & 11th. Much same
Comfortable - sickness gone. So I put her back on the old diet
of milk, Valentine's meat piece &
Apricot's jelly instead of ice milk &
Soda alone
Apr 8th. put her on 5 gr. of Potassium
iodide three daily again
Ghee & Soap water is being given every 3rd day. It acts well &
Great laeue in the seat & griping
in bowels.
Apr 12th. D - H - saw her with the today & thought her better than
when the last saw her on Mar 15th.
Pulse quieter & calmer.
Apr 15th
Calmer & improving. The bowels are
very troublesome & the stools painfull
& griping. Casts coming away
periodically. Evidently ammonous casts
of the klasseme
Holes on Case

Apr 27th

She is sickly & queer again with pain after food. I left Pot. Iodide (which she has been taking continuously for three weeks) out of the mixture again I ordered for a little Bismuth & Soda three daily. Pot. Bromide is being given as a sedative when required.

Apr 29th

Had terrible colicky & griping pains in the bowels & abdomen for the last two days. She says they came on in spuceus - Menstruation is coming on. I ordered 10 grains of Syrup Mopht to be taken if in pain. She had the bowels opened after an enema today & casts passed.

May 1st

She has not had much pain since Apr 29th. She only took one dose of the morphia. The Pot. Bromide seemed to ease the pain with a little brandy. She has been menstruating freely but the discharge is now passing off.

May 4th

She is comfortale again. Pain gone. Sausage less prominent & remains not so loud.
May 19th

I stopped the Pot. Indelic on Apr 27th but am starting it again today in a dose of 2/3 grains three daily.

May 22nd

Saw twice today - faint twice. Had some very bad fainting fits with convulsions during the afternoon. Saw her in the morning & found her pretty comfortable. I was called for about 8 P.M. Her husband & daughter said she had had hiccoughs & convulsions every hour or so since two o'clock in the afternoon. They said that when the attack came on her face twitched worked & was turned towards the left side & that the whole of her left arm & leg & side were worked about as well. That her legs were crissled up at times & her bowels convulsed. Her face being drawn with pain. After the convulsive twitchings she became quite stiff & reclined helpless for half an hour or more but came round afterwards appearing quite dazed. She herself said she could feel herself shaking but was
not able to control herself.

I saw her faint after I went to
see her but she had no convulsions
then but she had several attacks of
pain in the bowels.

Her pulse was very rapid 130 but
not strong & on examining the abdomen
the tuberous appeared more prominent
& with throbbing pulsation.

A little gradually improved by faintness
& the griping pains.

I found on inquiry that for the
last two days she had been
menstruating very freely & had lost
a large quantity of blood but was
not losing so much now. Therefore
I ascribed the pains to the
generative organs & bowels as a
result of the menstruation & 1 put
down the fainting & convulsions as
due to Cerebral Anaemia brought on
by loss of blood in a woman with
an abnormally circulatory condition
in the Ancecum. She suffered
from the same symptoms but in
a milder form 1 month & 2 months ago
viz. Decline, fainting, giddiness &
other mentioned formerly.

May 23rd Better but weakly from
from prostration loss of blood.

There is one symptom which has troubled her for a month or so which she has only just told me of which causes her great annoyance. Her water comes rushing from her in a gush without any warning especially after any little excitement. This is perhaps brought about by the size of the aneurysm in the midst of the sympatheticplexuses.

May 23rd. 27th

Been no more bad symptoms no more convulsive attacks. She is gradually getting back into the same state as she was before the last hemorrhage.

May 28th.

Increased the Pot. Iodide which she has been taking for the last eight days in 2 1/2 grain doses to 4 grains thrice daily.

May 30th.

Prescribed Op. Oelm. Cr. Two 30 to be taken when faint or having a sinking feeling in the left of the stomach which she has at times from June 4th to July 12th.

She was seen two or three times a
week & got on satisfactorily. Nothing special occurred. She menstruated naturally towards the end of June & the convulsive & faints did not occur as formerly. The iodide had been gradually increased up to grains 7 three daily. On July 7th an iodide rash had developed on the face & trunk & the pulse had become of markedly low tension & a little more rapid than normal 90 per minute. Therefore I reduced the Pt. iodide to go 5 twice a day.

From July 7th to Dec 12th a period of nearly five months, she took 5 grains of iodide three daily.

The anemia had improved considerably by Dec 12th. It was smaller. The murmurs was fainter & was now heard only a considerably smaller area. The extent of the murmurs upwards & downwards to right & left diminishing. The pulsation was not so visibly marked & could just be seen at one point. Her general condition had also improved. She was stout & her face looked took very bright.

On Dec 12th the iodide rash again came out markedly therefore I reduced
The iodide to 8 60ths in 16 doses, or
3 3/4 gr. twice a day. I gave her
this quantity up to the middle of
January, then stopped the iodide
altogether for one week in January,
without any she did not feel so
well so I gave her 90 gr. twice
a day up to March 23rd, when I
put her on grains 5 of iodide three
daily again. For the last nine
months she has not had a
collapse or fainting fit that
had been noticed with pain.
The only thing that has troubled
her has been the constipation.
As usual, she had the constipation
every 3rd day & casts come away
every two months or so. She has
not had gushes of urine since July. They stopped by degrees.
On March 23rd 1896, I examined
her carefully.
Her pulse was 80 for minute. She
expressed herself as feeling quite
well having a splendid appetite.
She was dressed up considerably
in bed & with comfort without faintness.
She menstruated regularly every
four weeks & lost a copious quantity
of blood. She has no faints or
Graviness or abnormal sensations before, during or after menstruation, none of the other pains or convulsions she used to have. She is still in bed but is propped up considerably now in the daytime. She can take anything that is given her now without discomfort, e.g. poached eggs, fish, fowl, chops, toast, bread, fruit &c. Pass of the bowel still come away but not so frequently nor so plentifully as formerly. There is still given every third day & she gets a motion comfortably & unattended by the exacerbating pain she used to have.

On examining the abdomen—she is seen to be considerably fatter. Palpation is just visible in the epigastrium. On percussion there is no dullness save just a slight relative dullness a little above & to left of the umbilicus. On palpation the aorta can be felt pulsating & at one point is felt to expand a little expansively & to be particularly firm there. On auscultation a faint murmur is
Hocks on Case

heard over this spot over an area 
2 square inches a little 
above it to the left of the umbilicus. 
This murmur is circumscribed & does 
not extend up or down any distance. 
No murmur at all high in epigastrium.
Hence I infer that the Aneurism, 
which a year ago was very large 
& covered an area much more 
intensive, has dwindled down by 
thickening of its walls to the small 
tumour I felt now. This has been 
brought about by absolute rest, 
the administration of Pot. Iodide & a 
suitable diet, with attention to 
any symptoms which arose. I 
think before long the murmur & 
tumour will have disappeared & 
the patient will be able to get 
about as formerly by degrees.

Today Mar. 23rd I am putting her 
again on 90 6 of Pot. Iodide three 
daily emulsed to gradually 
increase it to 90 72 three daily 
that she requires it.

Apr. 12th she has been 
taking 90 5 of Iodide three daily 
for about three weeks again.

There is no visible pulsation in abdomen.
Holes on Case

The tumour can just be heard with great difficulty over an area of less than 1/2 sq. inches, about 2 in. above and to the left of the umbilicus, no where else. Percussion dulness barely recognizable, but just what one would expect normally in that position on superficial percussion but deep percussion gives a little dulness.

Therefore as I said on May 23rd I feel confident that this tumour will practically disappear save for the thickened walls of the aorta at this point & the patient will be able to get about this summer, probably, very gradually at first but more more as time goes on.

This Case of Aneurysm of the Abdominal Aorta presents several interesting features:

1. It occurred in a woman, which is comparatively rare.
2. She had no idea of anything being wrong with her circulation & simply consulted me for her excruciating headache.
3. Constipation was a prominent symptom & obstinate constipation too.
The diagnosis was in abeyance for some time simply because I had not thought of aneurysm as the history given at first was rather vague and did not point to it particularly, but on more careful inquiry I found a most likely aneurysmal history.

There were many symptoms in the course of the case which one might consider very grave if ascribed to the aneurysm solely, but which were really not so grave on considering the concurrent circumstances e.g. the symptoms following menstruation, by the treatment had to be much modified owing to the symptoms sickness, fainting, constipation etc. and the Pol. Todee could not be given at first had to be stopped for a time after starting even then. The diet was not the usual aneurysm diet because of indigestion.

The aneurysm seems to have improved to a wonderful extent and the patient is in a much more satisfactory condition now than
She was a year or fourteen months ago still in all probability recover, as she has all but done so already—is will consider each of these features more in detail.

Occurrence in a woman. Anemias occur in men seven times more frequently than in women because of the more active occupations of men & their greater susceptibility to strain than women.

This woman had not been used to heavy work although she did her own washing with assistance. Her circulatory had probably been weakened by the severe illnesses from which she had suffered & her habitual indigestion.

Headache—her consulting me for her headache led me completely astray at first—I thought of heart or kidney disease but found none.

This headache was probably due to cerebral congestion brought on by the constipation to which she was subject. It would undoubtedly be aggravated by the presence of the
aneurysm interfering with the circulation, as it seemed to be slightly relieved by brandy & very much relieved, in fact, sent away entirely by the bleeding. This favours the view of its congestive origin. It was exaggerated by sleeplessness & restlessness.

3. Constipation
This has been a very prominent symptom that existed throughout & is still present. Dr. Roberts in his Practice of Medicine states that he has known cases of aneurism of the abdominal aorta in which this was the only symptom. Its presence led at first to considerable modification in the treatment of the case until it was finally relieved by enemas of soaps & warm ghee and regularly every third day & all opiates administered by the mouth stopped.

The presence of casts of the urine injected in the motions periodically & pain during their passage indicated a state of chronic catarrh of the intestine. The constipation which was present
Facts on Case

to a certain extent before the
aneurysm probably, but undoubtedly
not so markedly as later, was then
probably due to insufficient exercise,
improper food, sluggishness of the
muscular coats of the bowels or to
indigestion - the usual causes of
constipation - How it is
probably exaggerated has been
present in such a marked degree
from the presence of the aneurysmal
tumour which interferes with the
blood supply of all the intestines +
abdominal organs to a certain extent
The tumour by pressure on the
stomach & pancreas would aid
indigestion & constipation & its
presence in the midst of the
sympathetic pleuras of the abdomen
on the aorta, which supply the bowels
would tend to interfere with the
reflex act of peristalsis & would in
itself account for the constipation
There was quite sufficient time
too to account for the casts of the
large intestine from Cystitis due to
Anaemia & constipation.

As the tumour got smaller, the
casts became less abundant & were
been less frequently & the motions became free from pain & more easily induced by the emuca.

Diagnosis

Now the discovery of the tumour this was pretty easy & there was little doubt as to its nature.

The only doubt at first was whether it was simply aortic palpation in a thin emulsion woman but the presence of dullness on percussion, the limitation of the tumour & the murmur eliminated this. Had the tumour been small there would have been considerable difficulty in distinguishing it from the above condition, as she was just the woman in whom one would be able to feel the palpation of the aorta.

Malignant & Simple tumours were easily eliminated.

57 Symptoms in the Course of the Illness

The fainting fits & convulsions mentioned, one would have considered very serious & ascribed to pressure on nerves interference with circulation by the tumour.
Had they occurred indiscriminately, but it was noticeable that they only occurred to any marked degree at & after the menstrual flow & were I have no doubt ascribable chiefly to the loss of blood then & the sympathetic disturbance of the menstrual period. The presence of the aneurysm in the tender part was due to the sympathetic pleuruses of the aorta & its branches no doubt exaggerated the symptoms as they have not occurred for over eight months i.e. since the tumour has been improving. Had I not known of the presence of the aneurysm, one would have thought that the tumour was growing in an inward & backward direction & the prognosis would have been very grave in that case.

Sickness which occurred at times was perhaps due to pressure on the stomach & pancreas by the tumour & on the sympathetics & it was relieved by Bromide of Potassium & Belladonna.

The urine gathering from the without any warning particularly after any excretion was I think ascribable to the situation of the tumour which
probably involved the origin of the renal arteries with their pleureses & consequently interfered with the latter. She has been perfectly cool throughout the illness so I don't think any hysteria will account for this symptom. The ovarian artery pleureses being the interfered with might cause it & would aggravate the pains & fever during menstruation. At the time there has decreased & the symptoms consequently improved generally, all these symptoms have disappeared.

The treatment had to be varied & modified considerably from the usual quinine treatment.

At first I tried to overcome the constipation by various aperients but found the disturbance created by their administration too great for the effect produced & therefore I fell back on the administration of an enema of warm water & soap every third day which seems to have answered very well. The sickness & fever after food had to be treated & syr. bromthi (though bending) has had to be given...
Throughout the illness along with the Potassium Iodide, the diet has had to be carefully regulated until within the last two or three weeks it has consisted solely of milk, Valnetines meat juice & Brand's essence. Afterwards Bingers food was added with arrowroot & cornflour & lately fish, custards, milk puddings, bread, homemade beef tea & Chops have been tolerated & enjoyed, in fact anything reasonable. In the earlier months everything taken except milk, Valnetines & Brand's caused pain & sickness.

Potassium Iodide was given in 5 grain doses three daily from March 25th to 27th 1895, two days but as she felt sickness & vomited I stopped it for a time. I put her on 5 grains three daily again from Apr 8th to Apr 27th about 3 weeks. I then stopped it for three weeks Apr 27th to May 19th 1895. From May 19th to 28th she took 2 1/2 grains of Iodide three daily. After May 28th 4 grains three daily. This dose was gradually increased.
every two or three days until she was taking 7.5 grains three daily which was continued up to July 12th 1895; a period of over two months. On July 12th owing to the appearance of an iodide rash & rapid pulse I diminished the iodide to 5 grains twice daily. This was continued up to Dec 30 a period of close to five months when the rash again appeared & the rapid pulse, therefore I further reduced the iodide to 3 grains twice daily & gave her this for a time & then only 1.5 grains twice daily up to Mar 23rd 1896. When I again put her on 5 grains three daily I intended to increase to 7.5 grains.

With this treatment there is no doubt the case has improved & bids fair to recover entirely.

The administration of the iodide has not been by any means orthodox but I relied simply on the effect it produced giving as much as 7.5 grains three daily for a time & at another time giving as little as 1.5 grains.
twice daily with benefit. She has been taking codic in varying doses for over a year.

The success which I have met with in the treatment of this case emboldens me to record it and to hope that the thesis which I have composed will meet with your approval and will be deemed worthy of gaining me the degree of Doctor of Medicine of my alma mater to which I aspire.

John Richardson Armstrong
M.B., C.M.