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Anti-Spasmodic on the Rigid Os Uteri in Parturition.

By SALVATORE CARO, M. D.,

OF NEW YORK.

Delegate of the Medical Society of the County of New York to the Medical Society of the State of New York; Permanent Member of the American Medical Association; Fellow of the New York Academy of Medicine; Member of the New York County Medical Society; of the New York Pathological Society; of the New York Medical Library and Journal Association, etc., etc.

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ARTICLE XVIII.

Hydrate of Chloral as an Anti-Spasmodic on the Rigid Os Uteri in Parturition. By Dr. SALVATORE CARO, 643 Lexington avenue, N. Y.

Clinical observations on single cases is the foundation of true science. Whoever, in the daily exercise of his profession, meets rare and difficult cases, I consider it his duty to accurately publish the history of them, so that his colleagues may make use of his experience, and thereby enabled to be of service to humanity. November 1st, 1869, when Dr. A. Jacobi, of New York, read his valuable and learned paper on chloral before the Medical Society of the county of New York, he demonstrated hypodermically upon rabbits. The death-like muscular prostration and diminished animal heat suggested to my mind that, after trial, chloral might be classed among the sedatives or anti-spasmodics. It so happened I soon had an opportunity of testing its merits. (See *Medical Record of New York*, Jan. 1st, 1870, page 499.) A feeble old man of 86 years, with senile paralysis, had suffered from oblique inguinal hernia on the right side since the age of 24, and on the left, since a few years later, always wearing a truss except at night.

On retiring, 10 P. M., Nov. 1st, the intestine came down and he could not return it; after six hours I was hurriedly summoned at 4 A. M., Nov. 2d. I found the left hernia in the inguinal canal somewhat strangulated but easily reducible; the right was in the scrotum and obstinately resistant to all efforts at reduction. After a long and unsuccessful trial at taxis, I, a part of the time, lifting the body by the legs thrown over my shoulders, strong belladonna fomentations were applied and frequent doses of castor oil administered. The oil was vomited and the belladonna did no good. At 10 A. M. the patient was chloroformed to anæsthesia, but reduction was still impossible. He was then left for eight hours under the belladonna fomentations, when a tobacco enema was given with no benefit. Eight hours after this, and twenty-eight after the first discovery of the strangulation, the patient meanwhile growing weaker and more restless, with increasing abdominal pain and anxiety, recourse was had to the hydrate of chloral. The specimen used was prepared by E. Schering, of Berlin. One gramme and a half equal to twenty-three grains, was dissolved in mucilage and exhibited by the mouth.

Almost immediately the patient assumed a cadaveric aspect and appeared to be in articulo mortis. Alarming as were the symptoms, I at once again resorted to manipulation of the intestine, and to my surprise found it was easily returned within the abdomen twenty-five minutes after the chloral hydrate had been given. How to resuscitate the moribund patient was now my concern. I felt extremely doubtful of the result; my perturbation was by no means calmed by the family who stood around, charging me with having killed the old man, who was fast losing strength and growing cold. With no electric battery at hand, I was almost in despair; but a Davidson's syringe and a bottle of brandy gave me courage. The brandy diluted with milk was freely injected into the rectum, and in twelve hours my patient revived.

The dose of chloral hydrate administered was but three-fifths of that prescribed by Leibrech. Had this full dose been given, what would have been the result; or was the collapse of the patient due not alone to the chloral, but to the accumulative action of the other medicines?

This seemed improbable, as the chloroform had been given twelve hours, and the tobacco eight hours before. Perhaps the patient's advanced age and weakness rendered him specially susceptible to the prostrating action of the drug.

After relating the circumstances connected with the use of chloral, I shall discuss it as an anti-spasmodic on the rigid os uteri at the time of parturition.

Before entering upon its merits and effects, permit me to say a few words concerning labor, and define it according to Dr. E. W. Murphy.

"Labor is nothing else but the action of the uterus to expel its contents, when the fœtus is sufficiently matured to sustain respiratory life."

Labor has been divided and subdivided into natural, difficult, preternatural, complex, etc., etc. The scope of my paper will embrace only difficult labor, produced by rigidity of the os uteri.

In order to understand this with facility, with Denman I will divide it into stages; the first is fulfilled on the dilatation of the os uteri and rupture of the membranous sac; the second, on the expulsion of the child; the third, on the separation of the placenta.

During the first stage, labor pains are very slight and of short duration, but gradually they increase, and the os tincæ commences to dilate, and the membranes by the uterine contractions force their way through the os, sufficiently dilating it to enable the

head of the fœtus to pass through. When there is spontaneous rupture of the sac, followed by the escape of the liquor amnii, delivery soon follows. This is called natural labor. But it sometimes happens that labor becomes difficult and tedious at this stage. Many are the causes that can produce difficult labor; they may exist in the cervix uteri by its rigidity, in the vagina or perineum. When I say rigidity of the cervix, I do not mean that portion which is called uterine, but the inferior part which is called vaginal portion. The vaginal portion of the cervix being supplied, like the womb, with nerves from the ganglionic and cerebro-spinal system, becomes inflamed by any undue pressure and excites the muscular fasciculi, causing it to contract and become rigid.

Causes.

Primipars are more subject than multipars to difficult labor, for the reason that the cellular tissue is never so loose and permeable in the first instance as it becomes afterward. "The mouth of the uterus is more resisting, its structure retains its density and firmness, and consequently much more time is occupied in unfolding it." (*Murphy's Midwifery.*)

However reasonable this view may appear, still, in the majority of cases, to my knowledge, primipars between sixteen and twenty years of age have almost invariably natural and short labor (except in cases of malposition). But when they become mothers at an advanced age the views of Dr. Murphy are an invariable rule. In this case the os is more firm and resisting, close, compact, impermeable and void of lubricating fluids. The increased firmness and diminished vascularity in the tissues produced by age is generally the cause of os uteri rigidity; and if the woman, besides being advanced, be plethoric and robust, the os uteri is unusually dense, feeling like cartilage or perforated parchment.

The second cause of rigidity is the premature rupture of the membranes, and the gradual escape of the liquor amnii contained within the sac.

"By the smallest dilatation the liquor amnii insinuates itself within its openings, and expands it by lateral pressure upon its edges, and the womb is made to act in the most favorable manner to extend its mouth." (*Murphy.*)

But if the liquor amnii be discharged in the commencement of labor, before pains of any account set in, and dilatation not having

taken place, the consequence will be the exposure of the os uteri to irritation by friction from the head of the child on the cervix by *vis a tergo;* the lips become swollen, hot and tender, inflammation sets in, the cervix grows tense, less disposed to yield to the action of the uterus, and becomes rigid.

3d. Rigidity may be produced by syphilitic affection and other diseases.

The Symptoms are Variable.

The patient sometimes suffers slow and short pains, or they may be long and frequent. She may be troubled with coughing or vomiting, headache, extreme excitement, pulse varying, sometimes slow, or full and quick. Local symptoms are as variable as general ones. At times the vagina is found abnormally hot and dry, or moist and cool.

The most interesting symptom is the appearance of the os uteri, which varies, either sensitive to the touch, or contracted and rigid; this rigidity sometimes resembling the thickness of a No. 12 catheter, and hard as cartilage. Again, the cervix is found soft but not dilatable, and sometimes thin but when thin, as hard as perforated parchment, and with the sac either ruptured or not.

Many modern writers, especially our late esteemed Prof. George T. Elliot, in cases of rigidity, very highly extolled the use of either the warm douche or Barnes' dilator. These have proved so far serviceable remedies, but they are merely mechanical appliances, and in order to be properly used require the consent of the patient, a good amount of skill on the part of the physician, perseverance in both, and the wasting of much precious time. Primipars especially have great objection to exposure, or the use of instrument; if after long reasoning they consent, those surrounding the bed are sure to dissent. If by some unseen cause either the mother or child die, the doctor's reputation is forever lost. Great care must be observed in operating; comparatively facile as it may appear, it is sometimes accompanied with great distress. In using the douche, the first danger to be avoided is to see that the nozzle of the syringe does not injure the os or any other part of the uterus. 2d. That the water injected equals in heat the vagina and uterus, keeping up a constant stream, and allowing no air to be injected. Lastly, to watch the os, in order to ascertain whether it is dilating or becoming œdematous, and to decide when a second or a third douche is required.

Authors describe Barnes' dilator as easily introduced, when two fingers can pass into the os; but if the head of the child is found

pressing against the os, although dilatable, it will prove a great obstacle to its introduction. This instrument, although harmless, sometimes retards labor, even after the proper dilatation of the os has taken place. This happens when it is drawn into it by the spheroidal form of the uterus. It may rupture the membranes and cause a change of position of the fœtus. At other times it will not be retained *in situ*. In order to ascertain this, it is necessary to observe that the dilator be in proper position.

Now, gentlemen, admitting everything to be progressing favorably, still there is one important obstacle, the loss of time. Under the best of circumstances, before the os dilates with the douche, hours must elapse to accomplish labor, at least before using the forceps. The douche is slow in promoting dilatation, and with it I have never been able to deliver naturally, or by forceps under twelve or fifteen hours. I have never used Barnes' dilator, consequently can pass no opinion.

Morphine, depletion by venesection, leeching, belladonna smeared in the cervix, tartarized antimony, have been frequently used, proving if not negative, but of little service to accelerate dilatation and consequently labor.

To relieve these ordeals of pain, and bring on quick labor by relaxing the rigid os, there is nothing in my estimation equal to the hydrate of chloral.

Before proceeding further, I will place before you the theory of its action, propounded by Leibreich:

"Chloral treated by an alkali is resolved into chloroform and formate. The blood being an alkaline fluid, when the hydrate is introduced into the system, it will combine with the blood, and in the shortest interval will be changed to chloroform, and immediately commence its action upon the ganglia cells of the cerebrum. The more the chloroform develops, it extends its action to the ganglia of the spinal cord, and lastly to the ganglia cells of the heart."

Being so changed and quickly assimilated, you may draw the clearest indication of therapeutical value from the following observations and experiments: "The hydrate of chloral produces sleep, removes sensibility, brings down animal temperature and causes extreme muscular relaxation." (*Benjamin W. Richardson.*) Now, if the hydrate has such properties, it may be safely used in cases of pain, restlessness, exaggerated heat and extreme muscular tension.

As the os uteri is the most sensitive part of the whole organ, particularly at the time of labor, when it is rigid, the hydrate of chloral

snould be used in preference to any other drug, obtaining from it what is most desired, relief from pain, reduction of heat, gentle sleep, and by the muscular relaxation overcoming rigidity in the shortest possible time.

The few following cases will prove its intrinsic value. My patients have given me liberty to use their names:

Cases.

Bridget Kane, twenty-seven years old, ten months married, primipar, nervous temperament and irritable disposition. January 1st, 1870, on getting out of bed, she felt a small gush of water, and noticed it did not come from the urinary passage. As it was not her time to give birth, she felt alarmed and sent for me. Upon examination I found the vagina quite wet with watery fluid, and the os away back on the vagina, hardly large enough to admit the tip of my finger. She had, up to this time, but one pain. Finding no necessity to prescribe or stay, I told her to remain quiet, and to send for me when the pains returned. I was not summoned until the 18th of January, at 8 o'clock P. M. She informed me that from early in the morning the pains had been quite severe, but were then of no account, quite frequent and annoying; to quote her words, "they distress and fatigue me." Examining the vagina, I found it warm, dry and sensitive, the os a little more down than on the previous examination, slightly dilated and very hard to the touch. I tried to pass my index finger into the os, in order to ascertain the position of the fœtus, but could not succeed, owing to its great rigidity and exquisite tenderness. I waited two hours, but found no improvement. I prescribed a teaspoonful of United States solution of morphine, to be given every hour. An ounce was used without benefit. In the morning I proposed the douche, but she opposed. Dr. Jacobi's experiment, and the recollection of my friend with the strangled hernia, suggested that chloral would be of service. Although timid, I determined to make the trial, and on the 19th of January, twenty-six hours after the first pain, but not from the rupture of the membrane, I gave ten grains in mucilage, keeping my left hand on her pulse and my right index noting the changes of the os uteri. In a half hour indication of relaxation commenced, the vaginal heat and tenderness of the os disappearing, my patient became quite composed. At the commencement of the second hour I gave another ten-grain dose, and at its close the os was so fully dilated, and not wishing to waste more time, I used the forceps, and delivered her of a living

female child weighing seven and one-half pounds. In a few days she got out of bed and went from under my care.

To the chloral alone do I attribute the speedy yielding and dilatation of the os uteri in this woman, and her safe delivery.

Case 2.—Mrs. Margaret Devine, aged 32, primipar, very stout, but of lymphatic temperament. January 29, 1870, was taken sick in labor. I found her complaining of sharp, irregular labor pains; as she expressed it, "Not in my back, but in the privates." Passing the finger into the vagina, I readily reached the cervix, it being low down in the pelvis, but found it rigid and hard as cartilage, lips as thick as a pencil, very contracted, and the sac protruding as large as a thimble. I was careful not to meddle with it for fear of rupturing it. Advised a hip bath, and left with orders to send for me when the pains became more regular.

In the morning I called, and to my surprise found her sitting quite comfortably in the rocker, only having, as she said, occasionally, short and annoying pains. I again examined her and found the sac ruptured, the amnious fluid dribbling freely; otherwise no change.

Commencing to fear for the life of her child, I ordered ℥j fluid extract of belladonna, in a chamber of hot water, making her sit on it. After an hour of fomentations, nothing was obtained but fatigue. Prescribing a teaspoonful of the United States solution of morphine every hour, to quiet her, I left, calling occasionally, but found no material change.

From the 30th to the 31st, I used five douches at intervals of eight hours each, throwing about two gallons of water in a constant stream against the os; but instead of softening the os, it made it œdematous, irritating the patient to such a degree that I feared eclampsia.

February 2d, ninety-five hours from the first pain, I commenced using chloral, giving ten-grain doses every half hour. The first dose quieted her, and the pains gave signs of regular labor. In five hours I gave ninety grains, at the end of which time I was enabled to use the forceps, and delivered her of an almost dead male child; after a little work, assisted by Dr. A. Malony, the baby revived, and I was released after 100 hours of slavish work. What most surprised me in this case was that, after using the chloral, the pains, instead of diminishing, increased with more regularity and force, so as to accomplish labor without lingering, exhaustive pains. The placenta came after a few minutes, and the mother and child did well.

Case 3.—Catherine Fenton, aged 30, primipar, delicate and of lymphatic temperament. I was summoned to attend her in confine-

ment. On arriving I was informed that her pains had commenced forty-eight hours previous, but were insignificant. Examining her I found the membranes ruptured and the os rigid. On auscultation, not hearing the beating of the fœtal heart, I diagnosticated that the child was dead, and that something must be speedily done to save the mother's life. I gave ten-grain doses of chloral every half hour, and in two hours delivered her of a dead female child. Everything progressed favorably, and, being rather delicate, the milk gave us no trouble.

Case 4.—Rosey Dwyer, aged 29, of sanguinous temperament, primipar. March 21st, 1870, she informed me of her approaching delivery. I found her suffering severe pains, os sufficiently dilated to admit two fingers, and membranes protruding about the size of a hen's egg. Accidentally during my second examination, whilst in pain, the sac burst, water gushed out and the pains ceased for four hours. As the os commenced to show signs of rigidity and fearing long labor, chloral was resorted to; after using thirty grains, the cervix dilated so as to allow my hand to scoop around the head of the child, and with forceps I delivered her of a fine fat girl.

If I had not ruptured the membranes, no doubt labor would have terminated without interference.

The antispasmodic properties of chloral in cases of natural or accidental rigidity, if properly and timely used, will screen the accoucheur from blame.

Case 5.—Mary Maher, aged 19, primipar, small jolly Irish woman, healthy and of a nervous temperament; seventeen hours in labor, os rigid, open about the size of a two-shilling piece; membranes ruptured and no sign of dilation. Thirty grains of chloral in an hour and a half dilates the os, and in two hours she gives birth to a healthy female child, March 30, 1870. I had seven similar cases.

Case 13.—Elizabeth Sharkey, aged 24, very robust, hard-working woman, with a morose, gloomy disposition; primipar. May 6th, 1870, she sent for me to assist her in confinement. I found her nervous, expressing great fear. With much difficulty I succeeded in making a rather imperfect vaginal exploration. The os was sensitive to the touch, very little open, and rigid; membranes ruptured. Advising her to keep quiet, I left; returned in the evening; found her very excitable; gave fifteen-grain doses of chloral, the largest I have ever used, and the most in quantity, giving 180 grains in six hours, after the lapse of which time she gave birth to a male child weighing nine and one-half pounds. The placenta followed without

difficulty. About an hour after, as I was preparing to leave, she was seized with fearful eclampsia, which did not subside until after venesection to faintness; she rallied, but died nine days after of puerperal mania.

In this case I was dissatisfied with the chloral, attributing to it its inflammatory action, which might have affected the brain. So, whether the death of my patient was owing to the extra dose of chloral, or to the anæmic condition into which the brain was thrown after the depletion, has been a puzzling and distressing mystery to me.

The urine, after repeated analysis, gave no signs of renal troubles.

Case 14.—Mrs. Cecilia F., aged 28; multipar; very robust, and several times affected with syphilitic ulcers on the os and neck of the womb, contracted from her husband. July 21st, 1870, six A. M., I was informed she was in labor. I found her suffering pains about fifteen or twenty minutes apart; os dilated about the size of a penny, but, after the lapse of a few hours, gave no signs of further dilation. I left, returning in two hours; found no material change; left and returned at four P. M.: the os was a little more dilated and pains more frequent; I also ascertained that the head of the child was presenting, but could not define the exact presentation. At twelve M. the membranes ruptured, pains continuing without cessation every two or three minutes; but until 2 A. M. no material change had taken place in the os.

The most annoying symptoms in this case were the severe coughing and vomiting at every pain. Two hours after the membranes ruptured I gave ten-grain doses of chloral. The first relief obtained was the cessation of both cough and vomit. Six A. M., after the fourth dose, she gave birth to a puny boy. At the usual time she left her bed.

Case 15.—Mrs. Julia Cleary, 32 years old, very robust, sanguine temperament; multipar. Whilst pregnant with her first child her husband died. Fifteen years after, she again married. We may consider her as primapar in reference to the lost vascularity of the os uteri. January 6th, 1871, 6 A. M., had her first pain; 6 P. M., membranes ruptured without the proper dilatation of the os. January 7th, 2 A. M., after the 10th-grain dose of chloral, she gave birth to a healthy son.

Case 16.—Theresa Kiernan, aged 40, very delicate, and mother of nine living children. In labor eighteen hours; membranes ruptured two hours after the first pain; os rigid; prescribed chloral; four hours after the first dose, gave birth to a fine girl. March 3d, 1871.

Case 17.—Rosana Doran, aged 24, nervous temperament. May 29th, 1871, 8 A. M., labor commenced; pains irregular and of short duration; feverish and much excited; vagina quite hot and sensitive to the touch; cervix dilated only as large as a penny, and hard as perforated parchment. Digital examination was very painful. Thirty-one hours from the first pain, the membranes ruptured, but no sign of dilatation. I commenced giving five-grain doses of chloral. After the fourth dose, I could feel the os yield under my finger like a thin India-rubber band, and I was enabled to scoop my hand around the head of the fœtus, and, in five hours from the first dose, delivered her of a healthy male child.

I have had eleven similar cases, but delivered naturally without forceps.

Case 29.—Catherine D., aged 30, tuberculous, lymphatic temperament. Several times diseased with venereal ulcers on the womb, and has had buboes. At the time of labor, she was afflicted with secondary syphilitic ulcers on the legs and arms. Pulse normal; skin natural heat; pains succeeding each other every fifteen or twenty minutes. Urine previously analyzed; gave no signs of renal trouble; os rigid; different, however, from those above narrated. The os was as thick as my index finger, and as hard as a hard India-rubber ring, corrugated in many points. In attempting to introduce the finger, I could shift the whole mass into the flabby abdominal vault without producing the least change in the indurated os. She had already lost two children from long labor, and I feared my luck was to be no better than that of my predecessor. Pain progressed slowly, and twenty-eight hours from the first pain the membranes broke, the os remaining unchanged. Without losing time, I commenced giving ten-grain doses of chloral every half hour. A few minutes after, a manifest calm spread over her, pains progressed, and, at every dose, I could feel the softening and dilatation of the os.

After the use of 100 grains of chloral in five hours and a half, thirty-sixth of labor, whilst in a quasi sleepy stupefied condition, by external manual pressure over the flabby abdomen, she gave birth to a puny female child.

The cord being thin, I delivered the placenta by hand.

Had I not used chloral with this woman I am sure her child would have been dead born.

Gentlemen, if you will kindly bear with me a little longer, I will cite one more case, although not within the scope of my paper, which will prove the efficacy of chloral in rigidity of sphincters.

Mrs. B., aged 56, nervous, excitable disposition, very thin, but wiry and strong. 24th day of December last, after extinguishing the lights on the Christmas tree for her grandchildren, retired. On removing her double truss, found the intestines protruding through her left inguina.

A neighboring physician was called to her assistance, and after a few attempts at taxis, not succeeding to reduce it, ordered a poultice of ice, and then left. Was again called in the morning, and after a few minutes of manipulation, assured the old lady she was all right, and left. This was not correct. About 8 A. M. I was called to her assistance; ascertaining her condition, and remembering my success in my first case of strangulated hernia, I prescribed chloral. After one fifteen-grain dose, muscular relaxation followed, the ring relaxed, and the hernia was reduced.

My first dose of choral to the gentleman with the strangulated hernia was twenty-three grains, but the lesson then taught me made me, for a time, totally abandon its use. Reassuring myself of the harmless effects of the drug, I recommenced using it, but never in larger doses than fifteen grains every half hour or hour, always succeeding in obtaining the desired effect.

For the above reasons, also not wishing the mother to lose her consciousness in time of labor, and as small doses answer the purpose, I prefer to commence with the minimum, so, in case of necessity, I can increase without incurring the risk of having to pump milk and brandy into any one's rectum.

In the twenty-nine cases just reported, the forceps were used five times, and, if I had had but a little more patience, might have been used only twice. The child dead-born was diagnosticated as such before the use of either chloral or forceps. As to the death of the woman, if attributable to the chloral, I must confess I can give no account. The minimum of chloral used has been ten grains, maximum 180. Time used in relaxing the os, minimum, one hour; maximum, six. The smallest dose of chloral has been five, the largest fifteen grains. Ages of the twenty-nine cases varying from nineteen to forty; multipars five, primipars twenty-four.

Up to the time I commenced prescribing chloral, never having heard of its being used for similar purposes, without doubt I may lay claim to its priority. If my experience proves of service to my confreres, and relief to the suffering parturiants, I shall consider my work happily accomplished.