

ANESTHETIC MANAGEMENT FOR INTRACARDIAC SURGERY (ACQUIRED)

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The surgical correction of aortic regurgitation, aortic stenosis, mitral regurgitation and mitral stenosis are now established as acceptable operations by patients, cardiologists, surgeons, and anesthesiologists.

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The selection of patients pre-operatively is made in collaboration with the thoracic surgeon and cardiologist. It is essential, however, for the anesthesiologist to be thoroughly familiar with the essential physical signs and symptoms associated with the respective conditions. It is frequently the compilation of the history, i. e. severity of symptoms and the physical findings that will enable the anesthesiologist to know preanesthetically if it will be easily possible to maintain an adequate heart action during the intracardiac manipulations.

All forms of anesthesia for intracardiac surgery should follow similar principles. These include decreasing the irritability of the heart, lessening the factors of strain during the immediate pre-anesthetic period, during the induction and the course of anesthesia, and in the immediate post-anesthetic phase. They also embrace increasing the restricted oxygen utilization of the patient and the preservation of adequate cardiac action, which can be accomplished only by a careful minute by minute evaluation of the anesthetized patient.

The most serious anesthetic complications encountered during the course of anesthesia and intracardiac surgery are: Hypotension, oxygen want, carbon dioxide retention, serious cardiac arrhythmias and cardiac asystole.

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Aortic regurgitation is manifest by few symptoms until late in the course of the disease; then the symptoms are forceful heart beat (the patients frequently complaining of the bed shaking at night), shortness of breath, and nodding of the head with each heart beat.

The physical findings are a diastolic murmur heard over the aortic area, left ventricular hypertrophy, increased pulse pressure, Corrigan pulse, pistol shot femorals, and a visible capillary pulse.

Pre-anesthetic Preparation — The pre-anesthetic preparation, medication and anesthesiologic care are directed toward decreasing the irritability of the heart and lessening any factors such as nausea, vomiting, coughing, or straining that may be present just before, during, or in the immediate post-anesthetic period.

Preliminary Medication — Preliminary medication is directed toward of bringing the patient to the operating room rested and with the metabolic rate as nearly normal as possible. Pentobarbital (nembutal), 100 mgm. - 200 mgm. (1 ½ to 3 grains) is prescribed the night prior to operation. One hour prior to induction of anesthesia Secobarbital (seconal) 50 mgm. - 100mgm. (¾ to 1 ½ grain) is given by mouth. Atropine sulfate 0.30 mgm. to 0.60 mgm. (1/100 grain - 1/200 grain) is given by hypodermic injection. The dosage is dependent upon the pulse rate. It is considered desirable to have a pulse rate of 80 to 100 beats per minute prior to the administration of anesthesia.

A vein in the right wrist is canulated, after the administration of the pre-anesthetic medication, utilizing infiltration anesthesia.

After the patient is brought to the operating room, quiet is essential. A blood pressure cuff and stethoscope are placed in proper position on the left arm with the patient in the supine position. The pulse rate, blood pressure recording, and respiratory rate are determined and recorded on the anesthesia record.

A 0.2 per cent solution of procaine in 5 per cent glucose and distilled water is administered intravenously through the canulated wrist vein in the right arm. The solution is allowed to flow until 300 to 500 mgm. have been administered or until there has been a general slowing with strengthening of the pulse.

At the time of the preanesthetic examination and again prior to the induction of anesthesia the patient is told what to anticipate, and is reassured that he will be awake prior to the administration of thiopental sodium.

Thiopental sodium (Pentothal) 250 to 400 mgm. is administered in divided dosage following the intravenous injection of decamethonium bromide (syncurine) 2 to 4 mgm. which is given as rapidly as is possible intravenously.

The average doses of intravenous drugs received now are 350 mgm. of procaine, 350 mgm. of thiopental sodium (Pentothal), and 3 mgm. of decamethonium bromide (syncurine). The largest possible Magill endotracheal catheter with cuff is inserted under direct vision without trauma to the larynx. A mouth block of sufficient size to insure no obstruction of the rubber endotracheal airway by the teeth is inserted prior to the removal of the laryngoscope. The inflatable cuff is filled with air, and the catheter is secured in place by means of adhesive tape; under this method of management it is extremely rare to see a patient react or fight the endotracheal catheterization.

The lungs are then inflated with 100 per cent oxygen and the patient is turned into the lateral position. After the chest wall has been prepared for surgery and the drapes are placed, a mixture of 50 per cent nitrous oxide and 50 per cent oxygen is administered, each gas flowing at a rate of 2.5 liters per minute or more as needed. During all steps apnea is avoided. Respiratory function is controlled to assure adequate pulmonary ventilation with both adequate oxygen delivery and carbon dioxide elimination. A semi-closed technique with the carbon dioxide absorber cannister in the system is used; this allows adequate positive pressure to be used on the breathing bag reservoir.

All surgical activities are interrupted if ventricular tachycardia appears. The rate of flow of intravenous procaine is then increased and 200 to 500 mgm. of procaine amide (pronestyl) is injected intravenously. We believe that ventricular tachycardia nearly always precedes ventricular fibrillation, and that is easier to prevent ventricular fibrillation than to overcome it.

Whole blood is administered as indicated, by the intra-arterial route. We believe the blood administered by the intra-arterial route is three times as effective as by the intravenous route in restoring adequate systemic blood pressure, without the same danger of overloading the cardiovascular system.

Thiopental sodium is added as needed to keep the patient quiet and to allow adequate inflation of the lungs.

The usual dosage of procaine intravenously is 1 gram to 1.5 grams per hour, and is continued until after the pleura has been closed.

Surgery for aortic regurgitation taxes the skill of a very closely united surgical team. The anesthesiologist and the physiologist must tell the operator when the lesion has been corrected by means of the establishment of an adequate diastolic arterial blood pressure.

Second to second evaluation of the anesthetized patient must be used or complete occlusion of the aortic valve may take place prior to its recognition by the surgeon.

The patients are subjected to a thorough tracheobronchial toilet, and are extubated. Usually the patient is awake, moving and responsive at the completion of surgery. The patient is then returned to his room receiving oxygen by mask.

Aortic Stenosis

The cardinal symptoms of aortic stenosis are syncope (produced by low pulse pressure and poor cardiac output), chest pain, and difficulty in breathing.

The main physical findings that aid in the diagnosis are: systolic murmur heard in the aortic area, a systolic thrill, absence of the second aortic sound, left ventricular enlargement, and a low pulse pressure.

Aortic stenosis may be arterio-sclerotic, congenital, or due to rheumatic fever.

Once thoroughly developed aortic stenosis is a nearly completely intractable condition, poorly responsive to any medical therapy.

The poor response to medical therapy is due to a combination of factors. There is serious functional interference with the mechanics of coronary artery filling and circulation. This is coupled with the greatly increased demands made upon the coronary circulation by the hypertrophied and overworked left ventricular musculature. The need for great acceleration of blood flow through the narrowed aortic orifice adds tremendously to the work load of the myocardium.

Pre-anesthetic Preparation — The pre-anesthetic preparation and anesthesiologic care is directed especially toward decreasing the irritability of the heart, mainly the left ventricle and ventricular septum, and the same factors referred to above in the preparation of patients with aortic insufficiency.

Preliminary Medication — Preliminary medication is again directed toward having the patient rested, the metabolic rate nearly normal. Pentobarbital (Nembutal 1 1/2 - 3 grains) 100 to 200 mgm. is ordered the night prior to surgery.

One hour prior to induction of anesthesia atropine sulfate 0.30 mgm. to 0.60 mgm. (1/100 to 1/200 of a grain) is given by hypodermic injection. If the systolic blood pressure is greater than 100 millimeters of mercury in the left lateral position, secobarbital (seconal) 50 mgm. (3/4 grain) is given by mouth. In the event of the existence of a hypotensive state (systolic pressure less than 100 mm. of mercury) the barbiturate is not ordered, and the patient is brought to the operating room having received only atropine sulfate.

A vein in the right wrist is canulated under infiltration anesthesia.

After the patient is brought to the operating room, quiet is essential. A blood pressure cuff and stethoscope are applied over the left brachial artery. The pulse rate, blood pressure recordings are made. It is essential to find the true systolic and diastolic pressures. Often the palpatory systolic pressure is 10 to 15 mm. of mercury higher than the auscultatory pressure.

A 0.2 per cent solution of procaine hydrochloride in 5 per cent glucose and distilled water is started intravenously through the cannulated wrist vein in the right arm. The solution is allowed to flow rapidly, a constant check of pulse and blood pressure is required to avoid a further decrease in the pulse pressure; 350 to 600 mgm. is given initially, followed by a rapid intravenous injection of 3 to 4 mgm. of decamethonium bromide (syncurine), then 300 to 350 mgm. of thiopental sodium (Pentothal) is injected intravenously as rapidly as possible. An oxygen mask is placed over the patient's face and the lungs inflated for 30 to 60 seconds. An assistant palpates an artery (to detect ventricular fibrillation, which will usually occur prior to cardiac asystole) and keeps a constant check on the cardiac action while the patient is intubated. The largest Magill endotracheal catheter with cuff possible to be inserted without trauma is inserted under direct vision through the larynx into the trachea. The balloon is filled with air and its tube is clamped to insure an air tight connection. The catheter is secured in place by means of adhesive tape around the mouth block and endotracheal tube. It is again extremely rare to see a patient wretch or "buck" on the artificial airway.

The lungs are then inflated with 100 per cent oxygen by means of compression on the breathing bag. He is turned into the lateral position for surgery. If any degree of hypotension results there are two immediate steps to follow: a solution of methoxamine hydrochloride (Vasoxyl) should be started intravenously and an arterial cutdown for the transfusion of whole citrated blood should be started to support the filling of the coronary arteries.

Whole blood must be given rapidly to replace any blood loss occurring from the opening made into the left ventricle. We believe intra-arterial transfusions to be the most physiological.

The Procaine solution is continued until the chest wall approximation has been completed. The respiratory action is controlled by rhythmical compression on the breathing bag, and only oxygen is utilized as an inflation gas until after the commissurotomy of the aortic valve has been completed and the incision into the left ventricle has been closed. Then if the blood pressure, and pulse rate are satisfactory, nitrous oxide 50 per cent and oxygen 50 per cent are used.

Ventricular fibrillation is the most serious arrhythmias encountered. It is ultimately due to a decrease in the oxygenation of the myocardium, no matter what the precipitating cause; i. e.

inadequate oxygen concentration of the inspired gases, reflex irritability of the heart, or mechanical torsion due to difficulty in passage of the dilator; 5 per cent Procaine injected into the site of the ventricular puncture is helpful, procaine amide 250-400 mgm. is helpful if ventricular tachycardia precedes ventricular fibrillation; however, in no case, in our experience, has it been possible to overcome ventricular fibrillation prior to the successful dilatation of the aortic valve.

The usual dosage of procaine intravenously is 2 grams, thiopental requirements are 0.8 gram to 1 gram, decamethonium bromide is not repeated after the original dose has been injected.

The patients are thoroughly aspirated at the completion of surgery and gently turned from the lateral to the supine position. The patient should be kept in the operating room in the supine position for 10 to 20 minutes after surgery receiving oxygen by mask before being moved to his room. If the pulse rate exceeds 100 per minute, procaine amide 100 to 250 mgm. should be injected into the canula. The patient should be observed for hypotension and bradycardia prior to being discharged from the operating room.

Mitral Insufficiency

Mitral regurgitation is characterized by the symptoms of easy fatigueability, shortness of breath, and dependent edema. Arterial embolization is rare, in this condition. Pulmonary edema appears only with severe congestive failure. Auricular fibrillation is common.

Physical findings are a systolic murmur heard at the apex, decreased intensity of mitral 1st sound, left auricular enlargement, left ventricular hypertrophy, and hypotension.

Pre-anesthetic Preparation — Again the pre-anesthetic preparation, medication, and anesthesiologic care are directed toward decreasing the irritability of the heart, avoidance of hypotension by depressant drugs, and the maintenance of a slow (60-70 beats per minute) heart rate.

Preliminary Medication — Preliminary medication is Pentobarbital (Nembutal) 100 mgm. (1 ½ grains) orally the night prior to surgery. Secobarbital (Seconal) 50 mgm. (gr. ¾) 1 hour prior to the induction of anesthesia is prescribed if the systolic pressure is 100 millimeters of mercury or more. Atropine sulfate 0.30 mgm. (1/200 grain) is ordered if the pulse rate is 70 or more per minute, atropine sulfate 0.4 mgm. (1/150 grain) if the pulse rate is 60 to 70, and if the rate is less than 60 per minute, the dosage is increased to 0.6 mgm. (1/100 grain). It is helpful for a successful

anesthesia in the repair of mitral regurgitation to keep the pulse rate between 60 and 70 per minute during surgery. This allows a more complete filling of the left ventricle with blood and tends to conserve the myocardial tonicity.

A vein in the right wrist is canulated under local infiltration anesthesia.

After the patient is brought to the operating room a blood pressure cuff and the diaphragm of the stethoscope are applied over the left brachial artery, with the patient in the supine position. The pulse rate, blood pressure recording, and respiratory rate are taken and recorded on the anesthesia record.

A 0.2 per cent solution of procaine in 5 per cent glucose and distilled water is administered intravenously through the canulated wrist vein in the right arm. The usual 300 to 500 mgm. dose is administered by slow drip (10-15 minutes). Thiopental (pentothal) 100 mgm. is injected into the vein, followed by 2 to 4 mgm. of decamethonium bromide (Syncurine) then 200 to 250 mgm. of thiopental is again injected intravenously. The largest cuffed Magill endotracheal catheter that can be inserted without trauma is introduced under direct vision. The cuff is inflated, a mouth block inserted, the catheter connected with the gas machine and the patient ventilated with 100 per cent oxygen. The patient is then turned onto his right side, prepared for surgery and the thoracotomy is started.

If the blood pressure is maintained at 90 mm. of mercury or above, 2.5 liters of nitrous oxide and 2.5 liters of oxygen per minute are used to inflate the patient's lungs, while the respiratory action is controlled. If the pressure is less than 90 mm. of mercury, 100 per cent oxygen is used.

Whole blood is given as needed, via the intra-arterial route. Methoxamine hydrochloride (Vasoxyl) has been the most satisfactory vasopressor we have used to maintain a satisfactory (80 mm. of mercury) systemic blood pressure.

The patient with mitral insufficiency is the most incapacitated of all the acquired intracardiac lesions with whom an anesthesiologist must deal.

The same standards of constant evaluation and good anesthesiologic practice must be maintained as in the previously mentioned conditions.

Mitral Stenosis

The most frequent symptoms of mitral stenosis are shortness of breath, hemoptysis, auricular fibrillation, episodes of arterial embolization, and cyanosis of the lips.

Physical findings are a mid to a late diastolic murmur heard at the apex, a palpable thrill, left auricular enlargement and right ventricular hypertrophy.

We believe that the most favorable group consists of those patients with mitral stenosis who have excessive fatigability and increasing exertional dyspnea — but no active rheumatic fever, and in whom there is evidence of increasing pulmonary hypertension.

Auricular fibrillation, arterial embolization and recent congestive failure do not constitute contra-indication to mitral commissurotomy.

Pré-anesthetic Preparation — The pre-anesthetic preparation and medication is directed toward decreasing the irritability of the heart, lessening any factors such as nausea, vomiting, coughing or straining that may be present just before, during or in the immediate postoperative period.

Preliminary Medication — Pentobarbital (nembutal), 0.10 gram to 0.20 gram (1 ½ to 3 grains) is prescribed the night before operation. From an hour to an hour and a half prior to the induction of anesthesia, Secobarbital (seconal) 50 mgm. to 100 mgm. (¾ - 1 ½ grains) is ordered. If the systolic blood pressure in the lateral position is 110 mm. of mercury or greater, 100 mgm. is prescribed; a systolic pressure between 100 and 110 mm. of mercury, 50 mgm. is ordered. If the systemic pressure is less than 90 mm., no barbiturate is indicated. Atropine sulfate 0.30 mgm. to 0.50 mgm. (1/150 - 1/100 grain) is ordered, dependent upon the radial pulse.

A vein in the right wrist is canulated by means of local infiltration anesthesia.

Management of the Patient in the Operating Room

After the patient is brought to the operating room, absolute quiet is essential. The blood pressure equipment is placed on the left arm, with the patient in the supine position. The systemic blood pressure is determined, pulse rate noted and recorded.

A solution of 0.2 per cent procaine in 5 per cent glucose and distilled water is administered intravenously in the operating room; 350 mgm. to 400 mgm. of procaine is given prior to intubation.

Thiopental (pentothal) sodium is then given intravenously in the dose of 100 to 150 mgm., decamethonium bromide (syncurine) in varying doses of 2 to 4 mgm. is given as rapidly as possible intravenously, followed by 200 to 250 mgm. of thiopental sodium intravenously.

A Magill endotracheal catheter with cuff is then inserted under direct vision by the oral route.

One hundred per cent oxygen is administered until after the patient is turned into the lateral position. The chest wall is prepared and draped for thoracotomy. If the systemic pressure is 90 millimeters of mercury or greater, a mixture of 50 per cent nitrous oxide and 50 per cent oxygen is administered. Respiratory function is controlled to assure adequate pulmonary ventilation, with both adequate oxygen delivery and carbon dioxide elimination. Thiopental is repeated as required to keep the patient lightly anesthetized and to facilitate ease of respiratory control. Procaine is continued at a basic flow of 1 gram per hour. We believe that procaine affords analgesia, and that the combination of procaine, nitrous oxide and thiopental affords both analgesia and anesthesia.

Thiopental is not needed after the chest wall approximation has been started.

The procaine solution is also discontinued after the chest wall closure is started.

The patients are thoroughly aspirated and then extubated. We attempt to have the patients awake, moving and responsive at the completion of surgery.

Discussion

The general orders given for each patient with acquired heart disease after admission to the hospital are:

Cardiac consultation with the Staff cardiologist. The cardiologist will make the diagnosis, and then outline the medical regime.

Electrocardiography is routinely employed.

The routine roentgenograms are Posterior-anterior upright 72 inch film, Antero-posterior supine 36 inch film, left anterior oblique, right anterior oblique and left lateral (after barium swallow to outline the degree of esophageal displacement).

The Anterior-posterior 36 inch film is taken in the supine position as a guide to the globular outline of the heart in case pericardial effusion is suspected in the post-operative period.

Blood chemistry as a routine pre-operative laboratory study includes blood urea nitrogen (is increased in renal failure complicating heart disease), blood sugar, total blood proteins and the albumin-globulin ratio (total protein determinations are routinely low), prothrombin time, bleeding and coagulation time.

Complete blood count, hemoglobin determinations, and blood typing with cross matching of the blood is an established routine in all patients with cardiac pathology.

In addition to the night time sedation ordered the evening prior to surgery, 1 cubic centimeter of lipo-adrenal cortical extract is given intramuscularly. The antibiotics used routinely are crystallin 600.000 units twice daily for one or two days, and terramycin, two hundred and fifty milligrams, every six hours for a similar period of time.

The day of surgery, five cubic centimeters of aqueous adrenal cortical extract is injected intravenously into the cannulated wrist vein.

We believe quinidine should be avoided in all patients that are to receive intravenous procaine for at least thirty-six hours.

Conclusion

High concentrations of oxygen, with controlled respiratory function will insure adequate oxygenation in the severely handicapped patient. The lighter the plane of anesthesia the less depressed will be the patient's vital centers, and, consequently, a greater reserve can be maintained. This report covers over personal experiences of over 1500 anesthetics administered for surgery of acquired heart lesions.

Resumo

A correção cirúrgica de doenças cardíacas adquiridas é atualmente um método aceito por pacientes, cardiologistas, cirurgiões e anestesiólogos. O anestesiólogo deve ser familiarizado com os sinais clínicos, sintomas, etiologia e patologia destas condições mórbidas, a saber, regurgitação aórtica, estenose aórtica, regurgitação mitral e estenose mitral.

A seleção dos pacientes é feita em colaboração com o cirurgião torácico e o cardiologista. Qualquer forma de anestesia utilizada, deve seguir os seguintes princípios: diminuir a irritabilidade cardíaca, aumentar a reserva de oxigenação do paciente e preservar uma função cardíaca adequada. As complicações anestésicas mais comuns são: hipotensão arterial, anoxemia, hipercarbia, arritmias e assistolia.

Regurgitação aórtica — Os sintomas são poucos e aparecem tardiamente: batimentos cardíacos violentos (tremor no leito), dispnéia e balanceio da cabeça em cada batimento cardíaco.

Sinais clínicos: sopro diastólico aórtico, hipertrofia do ventrículo esquerdo, pressão de pulso aumentada, pulso de Corrigan, pulso femoral violento (pistol shot) e pulso capilar visível.

Preparo pré-anestésico no sentido de diminuir a irritabilidade cardíaca. Evitar náusea, vômitos, tosse e excitação física antes, durante e no período pós-operatório imediato.

Pré-medicação no sentido de trazer o paciente, à cirurgia, calmo e com o metabolismo normal, tanto quanto possível. Administração de pentobarbital (nembutal) 100-200 mg na véspera, secobarbital (seconal) 50-100 mg uma hora antes da indução e atropina 0,3-0,6 mg dependendo do pulso. Pulso ideal antes da indução: 80 a 100 por minuto.

Anestesia: Uma veia é canulizada e iniciada a administração de uma solução de procaína a 0,2 % em glicose a 5 %, gôta a gôta. Quando 300-400 mg de procaína são administrados, inicia-se a injeção de 250-400 mg de tiopental, em doses fracionadas, seguindo-se 2-4 mg de decametônio. Intubação endotraqueal imediata com cateter provido de manguito. E' extremamente raro o paciente reagir à intubação. Ventilação com 100 % oxigênio. Com o paciente em posição operatória e já colocados os campos cirúrgicos, inicia-se a administração de protóxido de azoto-oxigênio a 50 % (2,5 l de cada gás). Sistema semi-fechado com absorção de gás carbônico. Respiração controlada para assegurar ventilação pulmonar, oxigenação e eliminação do gás carbônico adequadas.

Quando aparece taquicardia ventricular (que precede a fibrilação ventricular) a intervenção é interrompida; o gotejamento de procaína é aumentado e 50-200 mg de procainamida são injetados, endovenosamente.

Sangue, quando necessário, é administrado por via intra-arterial. Esta via é 3 vezes mais efetiva para restaurar o volume perdido e evita a sobrecarga do sistema cárdio-vascular.

Tiopental é usado em pequenas doses, para conservar o paciente quieto e permitir a insuflação fácil dos pulmões. A dose usual de procaína é 1,0-1,5 g por hora.

Para a cirurgia da regurgitação aórtica é necessário uma equipe cirúrgica coesa. O anestesiolegista e o fisiologista dirão ao cirurgião quando o defeito foi corrigido, isto é, quando aparecer uma tensão arterial diastólica adequada. E' necessário o máximo de cuidado e atenção, do contrário pode ocorrer a oclusão completa do orifício aórtico, antes que o cirurgião a reconheça.

Terminada a cirurgia, a extubação é precedida duma eficaz limpeza tráqueo-brônquica. O paciente está geralmente acordado e movimentando-se é levado para o quarto com uma máscara de oxigênio.

Estenose aórtica — Sintomas: síncope (baixa pressão de pulso e volume-minuto cárdio insuficiente), dor torácica e dificuldade de respiração.

Sinais clínicos: sopro sistólico aórtico, frêmito sistólico, ausência da segunda bulha aórtica, aumento do ventrículo esquerdo e baixa pressão do pulso. A estenose aórtica pode ser devida à arterioesclerose, febre reumática ou congênita. Quando tardia e completamente desenvolvida é quase intratável, respondendo mal a qualquer terapêutica médica, devido aos seguintes fatores: interferência funcional com a mecânica do enchimento e circulação da artéria coronária, exigência tremenda imposta à circulação coronária pelo ventrículo esquerdo hipertrofiado e sobrecarregado, necessidade de uma maior velocidade de circulação através o orifício aórtico estenosado.

Preparo pré-anestésico semelhante ao anterior.

Pré-medicação semelhante à anterior. Se houver hipotensão abaixo de 100 mm sistólica, o secobarbital é omitido.

Anestesia. E' essencial determinar exatamente a verdadeira tensão arterial. Indução semelhante à anterior. Antes da intubação o paciente é insuflado com 100 % oxigênio, enquanto um assistente palpa uma artéria para deter fibrilação ventricular (que ocorre antes da assistolia) e verificar a função cárdica durante as manobras de intubação. Manutenção da anestesia com gotejamento de procaína, doses fracionadas de tiopental e 100 % oxigênio, com respiração controlada. Quando há hipotensão, uma solução endovenosa de metoxamina (Vasoxyl) é administrada e iniciada transfusão de sangue pela via intra-arterial. Após a comissurotomia e fechamento do ventrículo esquerdo, pode-se administrar protóxido de azoto a 50 %, se a tensão arterial e o pulso forem satisfatórios.

A fibrilação ventricular é a complicação mais grave e é sempre devida à hipo-oxigenação do miocárdio, qualquer que seja a causa: concentração inadequada de oxigênio na mistura inspirada, irritabilidade reflexa do coração ou torção mecânica quando da passagem do dilatador. A prevenção é feita

com procaína a 5 % na incisão ventricular e procainamida 200-300 mg se houver taquicardia ventricular. Todavia, em nenhum caso foi possível corrigir a fibrilação ventricular, antes da dilatação do orifício aórtico.

Dose média de procaína 2,0 g, de tiopental 0,8-1,0 g, de decametônio a dose para intubação.

Cuidados habituais para extubação e retorno do paciente ao leito.

Insuficiência mitral — Sintomas: fadiga, dispnéia e edema. O embolismo arterial é raro, edema pulmonar só existe quando há insuficiência congestiva, a fibrilação auricular é comum.

Sinais clínicos: sopro sistólico de ponta, primeira bulha mitral abafada, aumento da aurícula esquerda, hipertrofia do ventrículo esquerdo e hipotensão arterial.

Preparo pré-anestésico e pré-medicação semelhantes aos casos anteriores. E' desejável manter a tensão arterial acima de 90 mm sistólica e o pulso entre 60 e 70 por minuto.

Anestesia e cuidados durante a operação semelhantes ao caso anterior. Se a tensão arterial está acima de 90 mm sistólica, protóxido de azoto a 50 % é utilizado durante toda a intervenção.

O paciente com insuficiência mitral é o mais incapacitado deste grupo, sendo imprescindíveis atenção e cuidados constantes e minuciosos.

Estenose mitral — Sintomas: dispnéia, hemoptise, fibrilação auricular, episódios de embolismo arterial e cianose labial.

Sinais clínicos: sopro sistólico de ponta, frêmito palpável, aumento da aurícula esquerda, hipertrofia do ventrículo direito. Neste grupo, os pacientes que obtêm melhores resultados são aqueles que têm fadiga excessiva, dispnéia de esforço (sem febre reumática ativa) e com tendência à hipertensão pulmonar. Fibrilação auricular, embolismo arterial e insuficiência congestiva recente não são contra-indicações à cirurgia.

Preparo pré-anestésico e pré-medicação semelhantes aos casos anteriores.

Anestesia e cuidados durante a operação seguem a mesma rotina, com o uso de protóxido de azoto a 50 %, se a tensão arterial mantém-se acima de 90 mm diastólica.

Discussão — A rotina destes casos inclui as seguintes medidas pré-operatórias. Colaboração com o cardiologista para diagnóstico e esquema de tratamento médico. Eletrocardiografia. Radiografias do tórax em P. A. de pé, em A. P. em decúbito dorsal, em O. A. E., em O. A. D. e em I. E. com deglutição de contraste. Química do sangue: uréia, glicose, relação albumina-globulina, proteínas, tempo protrombina, tempo de coagulação e sangramento. Hematologia: hemograma, hemoglobina, hematócrito, tipagem.

Além da sedação noturna, na véspera da cirurgia é administrado 1 cc de extrato lipóide de córtico-suprarrenal, intramuscular. Antibióticos usados são: crystacillin 600.000 U. duas vezes ao dia e terramicina 50-200 mg de 6 em 6 horas, durante um ou dois dias. No dia da cirurgia são administrados 5 cc de extrato aquoso de córtico-suprarrenal, endovenosamente. O uso da quinidina deve ser evitado por 36 horas, pelo menos, em pacientes que receberão procaína endovenosa. — Z. V.
