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Publications of the Staff

of the Henry Ford Hospital and the Edsel B. Ford Institute for Medical Research

Titles and Selected Abstracts

Edited by G. B. Bluhm, MD


Several anion-exchange polymers, with different skeletal and functional group structure, were studied to determine their relative effectiveness in sequestering bile acids in both in vitro and in vivo systems. In the in vitro systems neither the structure of the functional groups, not their pKₐ or skeletal structure, appeared to have any effect on sequestering ability of the polymer. In rat in vivo systems, skeletal structure was of major importance. Polymers with cellulose skeletons were ineffective. Two anion-exchange resins, amberlite XE-268P and amberlyst A-26, proved to be highly effective bile acid sequestrants in both in vivo and in vitro systems.


Angiomatous lymphoid hamartomas are unusual tumorous enlargements of lymph nodes located particularly in the mediastinum, neck, and retroperitoneal region. Experience is reported with two patients having this entity, located in the neck in one patient and retroperitoneally in the other. The loss of normal lymph node histologic architecture is produced by prominent lymphoid follicles, an abundance of blood vessels penetrating the tissue from the capsule, and the absence of lymph sinuses. The term, choristoma, has been suggested to designate the lesion when it occurs in locations which do not normally contain lymphoid elements. When located in the chest and abdomen in children, the tumor has been reported to be associated with a refractory anemia, retarded growth, and a hyperglobulinemia. Although the clinical course of the tumor is benign, it should be completely removed and distinguished from more serious disease processes.


Cardiac arrest occurred in a boy with pulmonary lacerations during rapid transfusion of stored blood. EKG changes of hyperkalemia were evident which reverted partially after administration of glucose and insulin. The case points to the need for using fresh blood in rapid transfusions.
Abstracts


Plasma renin levels (PR) are elevated in severe or malignant hypertension. To see if this increase of renin is a concurrent phenomenon or a pathogenetic factor in the increase of the blood pressure (BP), severe hypertension was produced in 11 rats by tying the aorta between the renal arteries. Eight days later, the mean BP was 201± 3 (SEM) mmHg and the PR was 151± 35 ng ang. II/ml/hr (normal range 11± .6). In a second group of 12 rats the aorta was tied and the kidney under the ligature was excised. Eight days after coarctation BP was 120± 1.3 and PR was 14± 1. In a third group of 8 rats the aorta was tied and six days later antibody against angiotensin II was injected. Two days afterwards the BP was 126± 12. In a fourth group of 13 rats the aorta was tied and six days later normal rabbit plasma was injected. Two days afterwards BP was 227± 5. These results show: a) that the severe increase in BP was not due to the mechanical increase of the resistance, caused by complete coarctation of the aorta, but by a humoral factor produced by the kidney; and b) that this humoral factor is renin. No changes were observed in the blood pressure after the injection of antibody in normal rats or in rats with renal hypertension produced by clipping the renal artery (benign phase). The antibody was from the same pool as the one used in the rats with aorta coarctation. This gives support to the hypothesis that the renin-angiotensin system does not play a direct role as a vasoconstrictor in the maintenance of blood pressure in normotensive rats or in rats with renal hypertension in the benign phase.


The aging of normal bone is recognized by the diminution of cortical thickness (or enlargement of the marrow cavity) in tubular bones and also by the gradual thinning of trabeculae. Demineralization of bone occurs in rheumatoid arthritis (RA) initially in the juxta-articular area of an inflamed joint where trabeculae are narrowed and often lost, and also at a distance from the affected sites. This latter is probably the result of several independent factors facilitating bone loss, ie, relative disuse, possible reflex dystrophy, the systemic effect on bone metabolism of the disease itself and also the drug therapy utilized. Studies of rib biopsies labelled with tetracycline have shown that the RA patients on aspirin and also RA patients receiving adrenal corticosteroid had sufficient alteration in their bone cell dynamics to produce osteoporosis. Experimental animals (dogs and rabbits) were given various doses of different types of corticosteroid in high therapeutic doses. In dogs the corticosteroid-induced demineralization was reversed only if the drug was removed within three months. In rabbits severe bone loss was not followed by renewal. These animals also showed a distinctly different degree of bone resorption which related to the physical form of the corticosteroid used, even when given in identical doses. Soluble hydrocortisone produced a mild demineralization whereas the same dose of crystalline hydrocortisone had profound effects on bones.


Metabolic acidemia in infancy secondary to hypoxemia is a frequent cause of morbidity and mortality. The etiology of the condition is an inability of the individual to convert lactic to utilizable pyruvic acid, principally due to insufficient available O₂ for this conver-
Abstracts


Dermal or cutis grafts have been used for the purpose of reinforcing weakened areas of the abdominal wall in the repair of hernias and in plastic and reconstructive surgery. Long term follow-up observations have produced a number of instances of epidermal inclusion cyst and sinus formation. A case is presented in which an epidermoid carcinoma developed in a cutis graft 24 years after implantation. To the authors' knowledge, this is the first case reported. It is suspected that, with the passage of longer periods of time, malignant transformation occurring in cutis grafts will be reported more frequently.


Twenty-four clinically confirmed multiple myeloma patients (20 IgG and 4 IgA classes) were evaluated by six laboratory methods. The detection rates of paraproteins were: 55% of patients positive for Bence-Jones proteins in urine; 63% suggestive by electrophoresis; 50% suggestive by Laurell's two-dimensional immunoelectrophoresis; 50% suggestive by single radial immunodiffusion; and 88% positive by micro-double immunodiffusion technique. Micro-double immunodiffusion had advantages over other procedures for increasing the detection rate of para-proteins from 88% to 100% by using specific antisera for heavy and light chains. Routine immunoglobulin assays by micro-double immunodiffusion technique manifested 22 additional patients with paraproteins, alerting clinicians to potential multiple myeloma diagnosis.


This test has proved to be a useful, safe and highly accurate procedure for early diagnosis of intra-peritoneal hemorrhage that may occur in patients with multiple trauma or those who are unconscious. The procedure was performed in 101 patients with suspected intra-peritoneal hemorrhage. There were one false positive and two false negative results, and the overall accuracy rate was 97%.


The authors have previously shown a relationship between urinary kallikrein and sodium metabolism. To further clarify that relationship, the effect of sodium chloride loading on blood kinin content was studied in dogs. Fluids were given by an intragastric tube. Blood for the measurement of kinins was obtained from the inferior vena cava...
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Cephalic to the renal veins. Urine for the measurement of kallikrein was obtained by urethral catheterization. The blood kinins increased with the sodium loading; however, a decrease was observed when the salt-loaded dogs were previously nephrectomized. Water loading and blood sampling were without effect on the blood kinins. The urinary kallikrein was higher in sodium-loaded than in water-loaded dogs. It is concluded that sodium loading activates the renal kallikrein, thus supporting the hypothesis that the renal kallikrein system acts as a natriuretic factor.


Beef glomerular basement membranes (GBM), solubilized by sodium dodecylsulfate (SDS) and β-mercaptoethanol, were examined by disc gel electrophoresis and gel filtration chromatography. The beef glomeruli were sonicated in either 0.15 M or 1.0 M NaCl, and the basement membranes sedimented at 1300 X g. Disc gel electrophoresis in SDS showed that the 1.0 M preparation contained predominantly high molecular weight components; the 0.15 M preparation more low molecular weight components. Relatively high hydroxyproline content of the 1.0 M NaCl-sonicated membranes, in comparison with that of the 0.15 M membranes, clearly suggests a higher concentration of collagen-containing components in the former. Study of the effects of various solubilizing and dissociating reagents on disc gel electrophoresis patterns of the beef GBM clearly indicated the superiority of 1.25% SDS, containing 1% β-mercaptoethanol over other agents. Use of 7 M guanidine as a solubilizing agent resulted in a distinct set of relatively high molecular weight components not seen in the preceding disc gel patterns. Although some measure of separation of bovine GBM components was achieved by gel filtration chromatography on 6% Agarose A-5m, such studies were complicated by the apparent partial solubilization of the gel by SDS and elution of a soluble carbohydrate positive material.


The clinical usefulness of 25-hydroxycholecalciferol (calcifediol, 25-HCC) was determined in three patients with vitamin D-resistant rickets (familial x-linked recessive in two, and familial autosomal dominant in one). Two patients responded favorably to calcifediol (4,000 to 5,000 units/day) by the following criteria: They showed a net retention of calcium and phosphorus. Gastrointestinal absorption of calcium increased. Urinary excretion of phosphorus and the endogenous phosphorus clearance decreased. In one patient (with familial hypophosphatemia) serum phosphorus concentration and alkaline phosphatase activity returned towards normal; urinary total hydroxyproline increased and nondialyzable hydroxyproline decreased. The third patient (with familial hypophosphatemia) responded to calcifediol during the first 16 days of treatment with increases in serum phosphorus concentration and in urinary calcium excretion. However, he became resistant to calcifediol as treatment was continued.


The clinical, radiographic and histologic diagnosis of osteomalacia is briefly reviewed. The central role of either altered vitamin D metabolism or phosphate depletion in the pathogenesis is briefly discussed. The chemistry, sources, absorption and trans-
Abstracts


Remarkable changes, both medical and surgical, have occurred in the past 15 years in the treatment of bacterial endocarditis. Despite the increased frequency of endocarditis due to resistant organisms, the development of new effective antibiotics, especially the antistaphylococcal semisynthetic penicillin and cephalosporin, has greatly improved the outcome of this infection. More recently, new surgical techniques were introduced for treating refractory bacterial endocarditis, and the sequelae of this infection. Indeed, for optimal success as many as 15 per cent of patients with this infection may now require surgical therapy. The spectrum of surgical measures shown to be feasible and frequently necessary in the ideal management of patients with endocarditis have included the prevention of bacterial endocarditis in patients with a patent ductus arteriosus; the correction of a residual cardiac lesion following successful treatment of bacterial endocarditis; operations for bacterial endocarditis complicating cardiac surgery; operations for active resistant infections with irreversible cardiac failure; resection of a mycotic aneurysm; drainage of purulent foci; and embolectomy.


This paper reviews the known roentgen manifestations of metabolic bone disease. Osteoporosis, osteomalacia, and hyperparathyroidism are the traditional examples of metabolic bone disease. They are characterized radiographically by decreased bone density and, in many cases, are roentgenologically indistinguishable. Although metabolic bone diseases often show similar roentgenographic features, growing bones usually have distinctive characteristics (rickets, scurvy, osteogenesis imperfecta congenita). Pseudofractures are virtually pathognomonic of osteomalacia. Subperiosteal resorption of bone is the hallmark of hyperparathyroidism. Cystic lesions or osteosclerosis may also be seen in hyperparathyroidism. Bone density is usually assessed by visual inspection of radiographs, but more accurate methods of measurement of bone density are in use (densitometry, photon energy absorption).


Eleven patients were studied who had the hypoplastic left heart syndrome, defined as atresia of the aortic or mitral valve, or both, with normally related great arteries and intact ventricular septum. Group 1 (8 cases) comprised patients with early distress, ashen
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cyanosis and feeble or absent peripheral pulses in the presence of a hyperdynamic precordium and death in the first week of life. Group II (3 cases) comprised patients with good peripheral pulses, marked cyanosis and survival for more than one week. All of the patients had characteristic electrocardiographic and radiographic findings. In Group I, values for pulmonary oxygen saturation were elevated with pressures moderately increased. In Group II, oxygen saturation values were greatly lowered with markedly increased pressures. All patients had hypoplastic ascending aorta, large patent ductus arteriosus and diminutive left ventricle, left atrium and foramen ovale. Three of eight had abnormalities of the coronary sinus. A positive correlation can be made between the clinical appearance and the hemodynamic findings which may allow selection for palliative surgical procedures.


Two cases of esophageal obstruction associated with epidermolysis bullosa of the dystrophic type are described. The first case was that of a patient who had had epidermolysis bullosa since birth and had noted increasing dysphagia since the age of six. By age 24, she was unable to swallow at all, had lost considerable weight and the esophagus could no longer be dilated. A colonic interposition procedure was performed, and the patient has remained well. The second case was that of a 29-year-old woman who had had severe dysphagia for the past five years and was able only to drink liquids. A stricture of the cervical esophagus was identified and this was dilated by retrograde technique via a gastrostomy. These cases are the 49th and 50th of dystrophic epidermolysis bullosa with esophageal disease. If dysphagia does not occur before the early 20's, it is an unlikely complication of epidermolysis bullosa. Surgical therapy for dysphagia with epidermolysis bullosa should not be deferred if prolonged disability, starvation and death are to be prevented.


There is no specific x-ray lesion diagnostic of any one hematologic condition, but certain types and anatomic patterns of bony change suggest different underlying hematologic disorders. The spectrum of bony change seen in the leukemias, acute and chronic; the lymphomas, including Hodgkin's disease, Burkitt's lymphoma, and reticulum cell sarcoma; and multiple myeloma are described in this chapter. Examples of the less common lesions are shown, as well as some of the classical manifestations.


During the eleven-year course of lymphocytic lymphosarcoma in an elderly man, episodes of recurrent cholecystitis and cholangitis eventually resulted in surgical documentation of diffuse lymphosarcomatous infiltration of the wall of the gallbladder. This represents the first reported antemortem diagnosis of this manifestation of lymphosarcoma. Actual invasion of the gallbladder by Hodgkin's disease is also rare, although this has been previously reported on two occasions. This case further suggests that the less aggressive types of lymphosarcoma can be managed successfully by surgery, when resectable organs are involved.
Abstracts


Median nerve afferent action potentials can be recorded at the wrist in response to a current pulse applied to the index and middle fingers. Latencies of such action potentials have diagnostic value. However, because of difficulties in recording techniques, such latency measurements have not been widely used in clinical environments. A recording technique with very little stimulus artifact is presented. The article includes a description of a relatively simple electrical circuit producing stimulus current pulses of 20 micro-seconds duration and also a description of an unconventional electrode assembly to record the action potentials.


Although the association of urticaria with viral hepatitis has been mentioned in textbooks, it is usually considered uncommon. The authors recently observed three patients in whom urticaria was the presenting symptoms of viral hepatitis. One patient had no medical history suggestive of parenteral administrations and appeared to have clear-cut infectious hepatitis. Two patients gave a history of having had close contact with drug addicts who had been hospitalized before with hepatitis. Australia antigen could not be demonstrated in the one patient where this test was ordered. All three patients appeared disproportionally more ill than would be expected in uncomplicated urticaria. Urticaria may be an important presenting complaint in viral hepatitis. And, urticaria of unknown etiology may be due to mild anicteric hepatitis. In such cases appropriate investigations should be carried out.


Despite reported encouraging results with other therapeutic modalities, radical prostatectomy remains the procedure of choice in suitable patients with a localized cancerous prostatic nodule. Data is reviewed after radical prostatectomy performed between 1953 and 1968 at Henry Ford Hospital. Of 38 cases followed at least 5 years, 35 (92%) patients were alive: 30 (79%) without evidence of carcinoma, and 5 (13%) required further palliative therapy. Of 18 patients followed at least 10 years, 13 (72%) are alive; 9 (50%) without recurrent disease. Survival of 41% with 29% tumor free is noted at follow-up of at least 14 years. The classic radical perineal prostatectomy procedure has been used in most instances. Classification of operable lesions corresponded with Stage B of Whitmore. Except for one patient, no radical procedures have been done for latent carcinoma. No operative mortalities resulted and no alarming, immediate post-operative complications occurred except for one ureteroperineal fistula. Significant post-operative incontinence was a common complication. Patients with post-operative recurrence of neoplasms in most cases have been immediately placed on hormonal therapy. Survival rates at nearly 15 years compare favorably to the anticipated survival of a comparable group of males in the general population without carcinoma of the prostrate.


Malignant testicular tumors have previously been reported in five sets of twins and four sets of non-twin brothers. Herein is recorded the fifth set of non-twin brothers with primary testicular malignancies, but the first pair of non-twin siblings with histologically verified testicular tumors of the same cell type.
Abstracts

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