ESPASMO DE ARTÉRIA CORONÁRIA

PREMIO "CERTIFICATE OF HONOR" OF THE AMERICAN COLLEGE OF ANGIOLOGY AND INTERNATIONAL COLLEGE OF ANGIOLOGY

APÓS 2 ANOS E 8 MESES NO ENTÃO FAMOSO INSTITUTO NACIONAL DE CARDIOLOGIA DO MEXICO, NO PERIODO 1961- 1962, STANS INICIOU O FELLOWSHIP NO CARDIOPULMONARY LABORATORY St JOSEPH'S HOSPITAL SYRACUSE , NY, USA, DIRIGIDO POR GOFFREDO GENSINI QUE ESCREVEU O CAPITULO CORONARY ARTERIOGRAPHY DO BRAUNWALD'S HEART DISEASE UM DOS LIVROS MAIS IMPORTANTES DE CARDIOLOGIA DA ATUALIDADE.

STANS CONSIDERA O PERIODO NOS EEUU O MAIS PROFICUO E VITORIOSO DE SUA VIDA PROFISSIONAL. APOIADO E PREPARADO COM TODA ATENÇÃO POR GOFFREDO GENSINI E SUA OTIMA E GENEROSA EQUIPE E DESTACA A E.FICIENTE ENFERMEIRA KATHLEEN KELLORAN QUE AJUDOU STANS EM TODAS AS CIRURGIAS EXPERIMENTAIS E EM TODOS OS PROCEDIMENTOS HEMODINAMICOS.

STANS REALIZOU AS PRIMEIRAS CINECORONARIOGRAFIAS DE SUA VIDA COINCIDINDO COM O INICIO DESTE PROCEDIMENTO QUE REVOLUCIONOU A CARDIOLOGIA DAQUELA ÉPOCA PERMITINDO O DIAGNOSTICO PRECISO E O INICIO DO TRATAMENTO CIRURGICO E POSTERIORMENTE A HEMODINAMICA INTERVENCIONISTA DA DOENÇA CORONARIADA.

SITE www.ipgmrj.com.br

CORONARY ARTERYSPASM HISTÓRICAL FIRST REPORT IN THE LITERATURE

NUMA MANHÃ STANS MURAD-NETTO REALIZAVA A CINECORONARIOGRAFIA DE UMA PACIENTE COM HISTORIA DE ANGINA DO PEITO AUXILIADO PELA ENFERMEIRA KATHLEEN KELLORAN NO SERVIÇO DO DR GOFFREDO GENSINI, NO St JOSEPH'S HOSPITAL SYRACUSE, NEW YORK, USA ONDE ATÉ JULHO DE 1962 A TECNICA USADA NAQUELE SERVIÇO ERA A TECNICA DA ACETILCOLINA (0.4 mg INJETADA NA RAIZ DA AORTA NA DIASTOLE).

A POUCAS HORAS DE DISTANCIA, EM CLEVELAND, MASON SONES E EARL SHIREY INICIAVAM A CINECORONARIOGRAFIA SELETIVA E GENSINI FOI UM DOS PERSISTENTES DIVULGADORES DA TECNICA DE SONES E ESCREVEU O CAPITULO DE ARTERIOGRAFIA CORONARIA DE UM DOS MAIS IMPORTANTES LIVROS DA CARDIOLOGIA O BRAUNWALD'S HEART DISEASE.

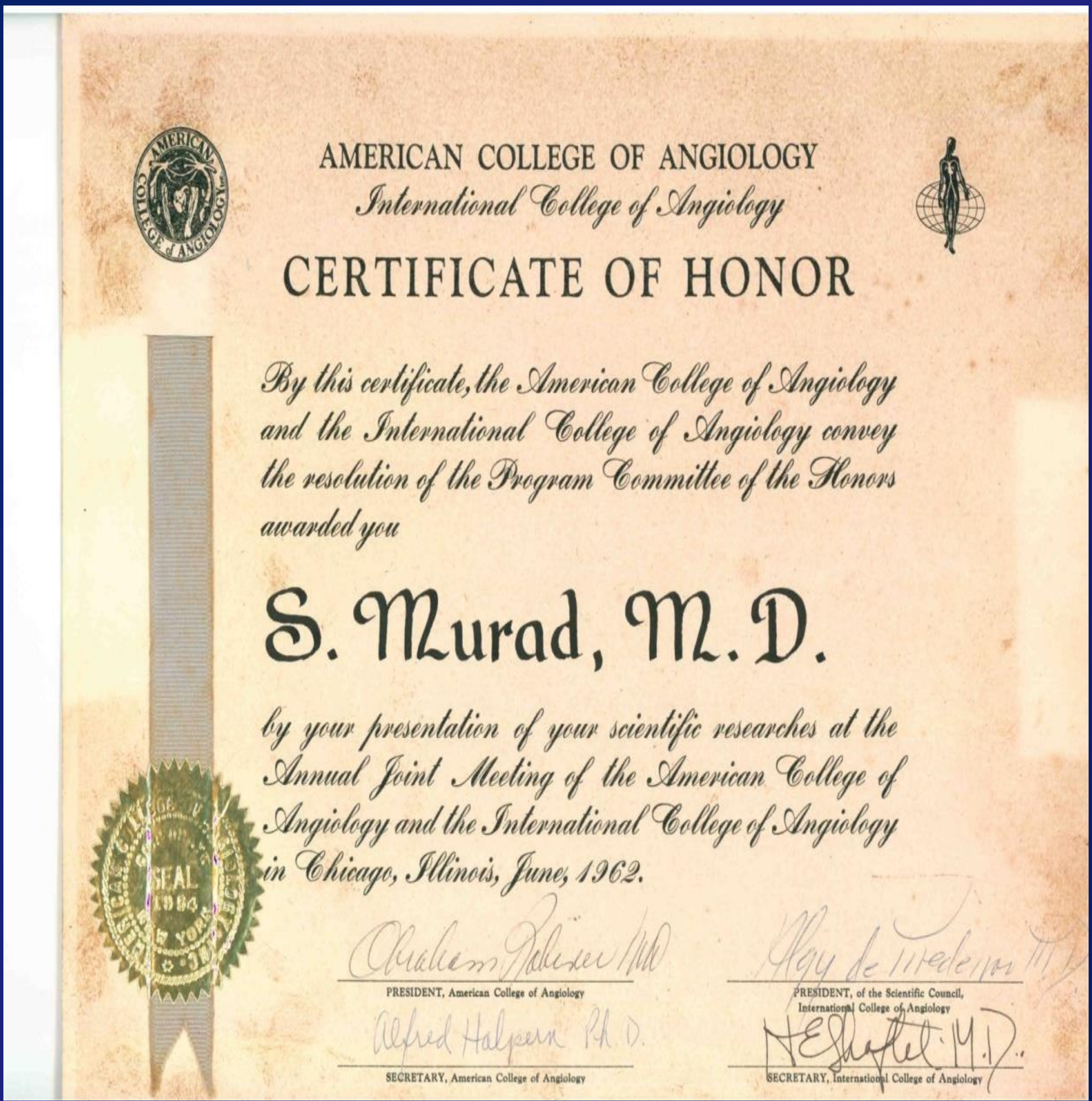
LOGO APÓS A INJEÇÃO DO CONTRASTE A PACIENTE TEVE FORTE DOR PRECORDIAL E SUPRADESNIVEL DO SEGMENTO ST NO ELETROCARDIOGRAMA COM A SUSPEITA INICIAL DO CATETERISMO. STANS INDICOU QUE MEDICASSE A PACIENTE COM DINITRATO DE ISOSORBITOL (ISORDIL) DE 5mg SUBLINGUAL RECÉM LANÇADO E APÓS ALGUNS MINUTOS A DOR E A ALTERAÇÃO ELETROCARDIOGRAFICA DESAPARECERAM.

A ARTERIOGRAFIA CORONARIA DO EPISODIO DA DOR MOSTROU OCLUSÃO DA ARTERIA CORONARIA DIREITA NO SEU TERÇO PROXIMAL, JÁ ESTAVA MELHOR A PACIENTE SEM DOR E COM REDUÇÃO DE SUPRADESNIVEL DE ST, RECUPERADO GENSINI MANDOU REPETIR A CINECORONARIOGRAFIA QUE MOSTROU DESAPARECIMENTO DA OCLUSÃO E NO LOCAL HAVIA UMA PLACA COM ESTENOSE MODERADA DA ARTERIA CORONARIA DIREITA INDICANDO ESPASMO DA ARTERIA CORONARIA DIREITA QUE CEDEU COM O VASODILATADOR.

ESTE CASO FOI PUBLICADO NA REVISTA ANGIOLOGY 1962;13: 550-553 POR: GENSINI, DI GIORGI, MURAD-NETO E BLACK

2-“CERTIFICATE OF HONOR.”

TRABALHO PREMIADO PELO AMERICAN COLLEGE OF ANGIOLOGY E INTERNATIONAL COLLEGE OF ANGIOLOGY:
PRIMEIRA DEMONSTRAÇÃO DE ESPASMO DE ARTERIA CORONARIA NO SER HUMANO



AMERICAN COLLEGE OF ANGIOLOGY

International College of Angiology

CERTIFICATE OF HONOR

By this certificate, the American College of Angiology and the International College of Angiology convey the resolution of the Program Committee of the Honors awarded you

S. Murad, M.D.

by your presentation of your scientific researches at the Annual Joint Meeting of the American College of Angiology and the International College of Angiology in Chicago, Illinois, June, 1962.

PRESIDENT, American College of Angiology

PRESIDENT, of the Scientific Council, International College of Angiology

Alfred Halpern Ph.D.

SECRETARY, American College of Angiology

SECRETARY, International College of Angiology

ESPASMO DE ARTERIA CORONARIA

EM JUNHO DE 2011 EM FASE DE IMPORTANTE STRESS E APÓS SUBIR RAPIDO UM ANDAR DE ESCADA STANS SENTIU DESCONFORTO PRECORDIAL OPRESSIVO E TEVE UMA SINCOPE.

QUANDO RECUPEROU A CONSCIÊNCIA AINDA COM MAL ESTAR, MASTIGOU DOIS COMPS DE ASPIRINA DE 100mg E UM DE NITRATO E APÓS 30 MINUTOS DEITADO JÁ MELHOR O ELETROCARDIOGRAMA MOSTROU SUPRA DE ST DIAFRAGMATICO DE TRÊS mm QUE DESAPARECEU COMPLETAMENTE EM CERCA DE 30-40 MINUTOS PERSISTINDO LEVE ATORDOAMENTO.

A CINECORONARIOGRAFIA FEITA ALGUNS DIAS DEPOIS REVELOU ESTENOSE MODERADA EM ARTERIA DESCENDENTE ANTERIOR. DESDE ENTÃO PERCEBIA ÀS

VEZES DISCRETO DESCONFORTO PRECORDIAL COM ESTRASSISTOLES E SENSAÇÃO DE LEVE MALESTAR QUE DESAPARECERAM COM A SUBSTITUIÇÃO DA TELMISARTANA PELA MANITIDINA (MANIVASC 10 mg) NO CONTROLE DA HIPERTENSÃO ARTERIAL.

QUANDO SUSPENDEU A MANITIDINA (BLOQUEADOR DE CALCIO) VOLTOU O DESCONFORTO OPRESSIVO QUE DESAPARECEU COM A VOLTA DA MEDICAÇÃO INDICANDO PROVAVELMENTE NOVOS ESPASMOS DE ARTERIA CORONARIA.

MESTRE EVANDRO TINOCO ACERTADAMENTE DISSE: "STANS FOI VITIMA DE SUA CRIAÇÃO, O ESPASMO CORONARIANO" DESCRITO POR GENSINI, DI GIORGI, MURAD-NETTO E BLACK.

ESPASMO DE ARTERIA CORONARIA

O ESPASMO DE ARTERIA CORONARIA É UM EPISÓDIO FREQUENTE E MUITO IMPORTANTE NOS PACIENTES COM ANGINA E/OU ISQUEMIA MIOCARDICA E A ACETILCOLINA TEM SIDO USADA COMO TESTE DIAGNOSTICO.

"THE ACH TEST TRIGGERED EPICARDIAL OR MICROVASCULAR CORONARY SPASM IN NEARLY TWO-THIRDS OF THESE PATIENTS" JACC; 2012; 59 ::655-662

"INTRACORONARY ACETYLCHOLINE TESTING AMONG 1000 PATIENTS WITH CPNCA:"

a) 32.4% FREQUENCY OF EPICARDIAL SPASM (>75% DIAMETER REDUCTION WITH ANGINA AND ISCHEMIC EKG SHIFTS) AND

b) 23.6% OF MICROVASCULAR SPASM (ANGINA AND ISCHEMIC ECG SHIFTS WITHOUT EPICARDIAL SPASM)
Peter Ong; Anastasios Athanasiadis; Gabor Borgulya;et all
Bosch Medical Center, Stuttgard. Germany
JACC 2012 ; 59(13s1) : E1487 – E1487

O TRABALHO DE ESPASMO DE ARTERIA CORONARIA FOI DESTACADO POR RICHARD CONTI, NAQUELE TEMPO, PRESIDENTE DO AMERICAN COLLEGE OF CARDIOLOGY, E FOI PUBLICADO NO AMERICAN JOURNAL OF CARDIOLOGY 1987; 60:173-174.

EM DUAS DAS SETE REFERENCIAS BIBLIOGRAFICAS MAIS IMPORTANTES DA VIDA DE GENSINI ESCOLHIDAS POR RICHARD CONTI STANS MURAD-NETTO ESTÁ EM DUAS.

VEJA AS REFERENCIAS 6 E 7.

Reprinted from ANGIOLOGY *The Journal of Vascular Diseases*
Official Journal of the American College of Angiology and the International College of Angiology
Vol. 13, No. 12 December, 1962

ARTERIOGRAPHIC DEMONSTRATION OF CORONARY ARTERY SPASM AND ITS RELEASE AFTER THE USE OF A VASODILATOR IN A CASE OF ANGINA PECTORIS AND IN THE EXPERIMENTAL ANIMAL

GOFFREDO G. GENSINI, M.D., F.A.C.C., SALVATORE DI GIORGI, M.D., STANS MURAD-NETTO, M.D., AND ASHER BLACK, M.D.

WITH THE TECHNICAL ASSISTANCE OF ANN E. KELLY, R.N.

INTRODUCTION

Since 1959 we have been interested in contrast visualization of the coronary vascular system. We have reported previously on a new method of coronary arteriography.[1] This method has now been extensively used in over 100 clinical cases. Recently, we have been able to show angiographically, in a patient with angina pectoris, the occurrence of coronary artery spasm and its disappearance after the use of coronary vasodilators. Subsequently, we reproduced a similar arteriographic pattern in the coronary arteries of dogs by inducing coronary spasm with Pitressin and demonstrating its release with a coronary vasodilator.

CASE REPORT

A 49-year-old white woman first noted substernal chest pain with arm radiation and choking sensation in December 1960 while shoveling snow. Since then the pain has recurred with exertion and excitement. She experienced distinct relief with nitroglycerin during the first few months of treatment but variable relief thereafter.

In October 1961, the pain began to reappear even during light activity and occasionally when the patient was at rest without specific precipitating factors. Night awakening with pain had also been noticed.

Physical examination. Chest x-ray, upper G.I. series, barium enema and cholecystography were all within normal limits. Blood pressure: 138/80. Cholesterol: 240. Family history was noncontributory. Routine laboratory examinations were within normal limits.

From the Msgr. Toomey Cardiopulmonary Laboratory and Research Department of St. Joseph's Hospital, Syracuse, New York. This study was supported, in part, by Research Grants of the American Heart Association (Grant No. 61 G 130) and the Heart Association of Onondaga County. Presented at the meeting of the American College of Angiology, June 1962, in Chicago, Illinois.

An electrocardiogram (fig. 1) taken in March 1961 was within normal limits when the patient was at rest. A Master two-step test was considered positive and consistent with the diagnosis of coronary insufficiency.

On January 18, 1962, the patient was admitted to St. Joseph's Hospital. After premedication with barbiturate and under local anesthesia, a no. 7 Teflon catheter was introduced into the femoral artery according to our routine percutaneous technique.[1, 2]

The catheter was placed at the level of the aortic valve and 0.4 mg of acetylcholine was injected in diastole. A 6-sec. period of cardiac arrest was produced, during which 30 cc of Renografin-76* were delivered through the catheter. This same sequence of events was repeated on three separate occasions, during which we obtained two lateral projections and one A-P projection of the chest with the Schoenander single plane seriograph.

Shortly after the first injection, the patient experienced chest pain, similar in character and radiation to her usual attacks of chest pain.

The patient was given a 5-mg tablet of isosorbide dinitrate† sublingually. After 3½ min., the arteriogram was repeated with exactly the same techniques and position as for the first one obtained.

After this second injection of the contrast material, the acute chest pain, which had subsided almost completely, reappeared as a dull ache. Another 5-mg tablet of Isordil was given, and 5 min. later the pain had disappeared. Then the third injection of the contrast material was made.

The first series of films (fig. 2) showed good filling of the first centimeter of the right coronary artery with good visualization of the sinus branch. However, the greatest portion of the right coro-

* Diatrizoate methylglucamine, Squibb Laboratories.

† Isordil® (isosorbide dinitrate), Ives Laboratories, New York, N. Y.

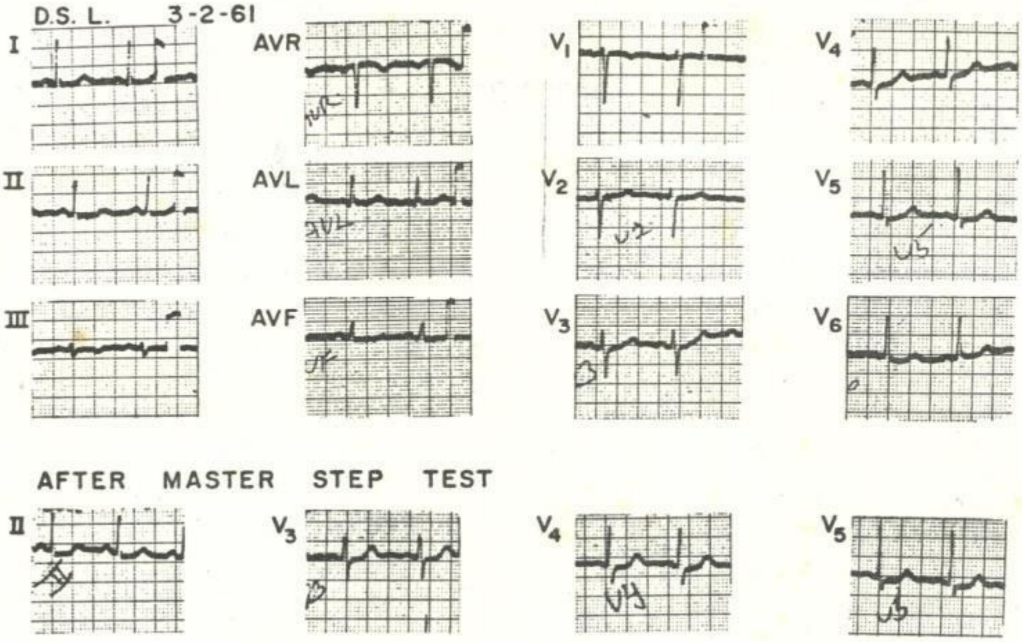


FIG. 1. D.S.L., a 49-year-old woman. Resting electrocardiogram and selected leads after the Master two-step test.

FIG. 2.

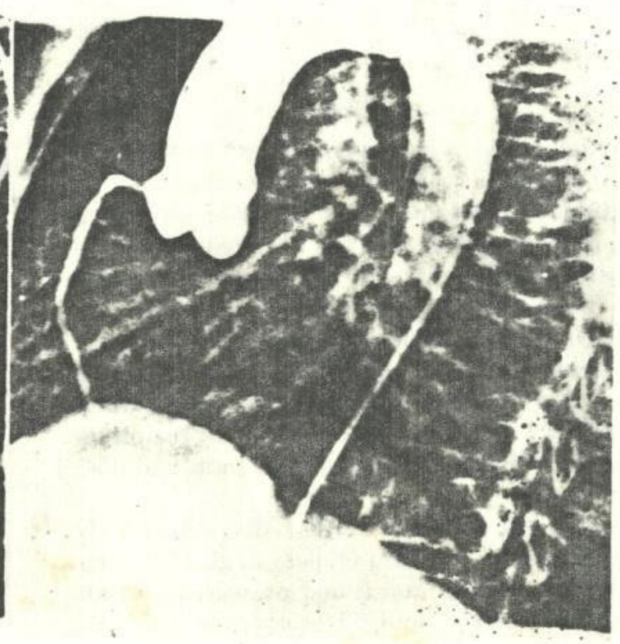


FIG. 3.

FIG. 2. D.S.L. Baseline coronary arteriogram, lateral view

FIG. 3. D.S.L. Coronary arteriogram, lateral view, 3½ min. after 5 mg of isosorbide dinitrate sublingually.

nary artery was not visualized. There was poor filling of the left coronary artery.

The second injection (fig. 3), made 3½ min. after the administration of Isordil, showed a good opacification of the entire right coronary artery. The left, however, was still poorly visualized.

The last series of films (fig. 4), taken after the second dose of vasodilator while the patient was

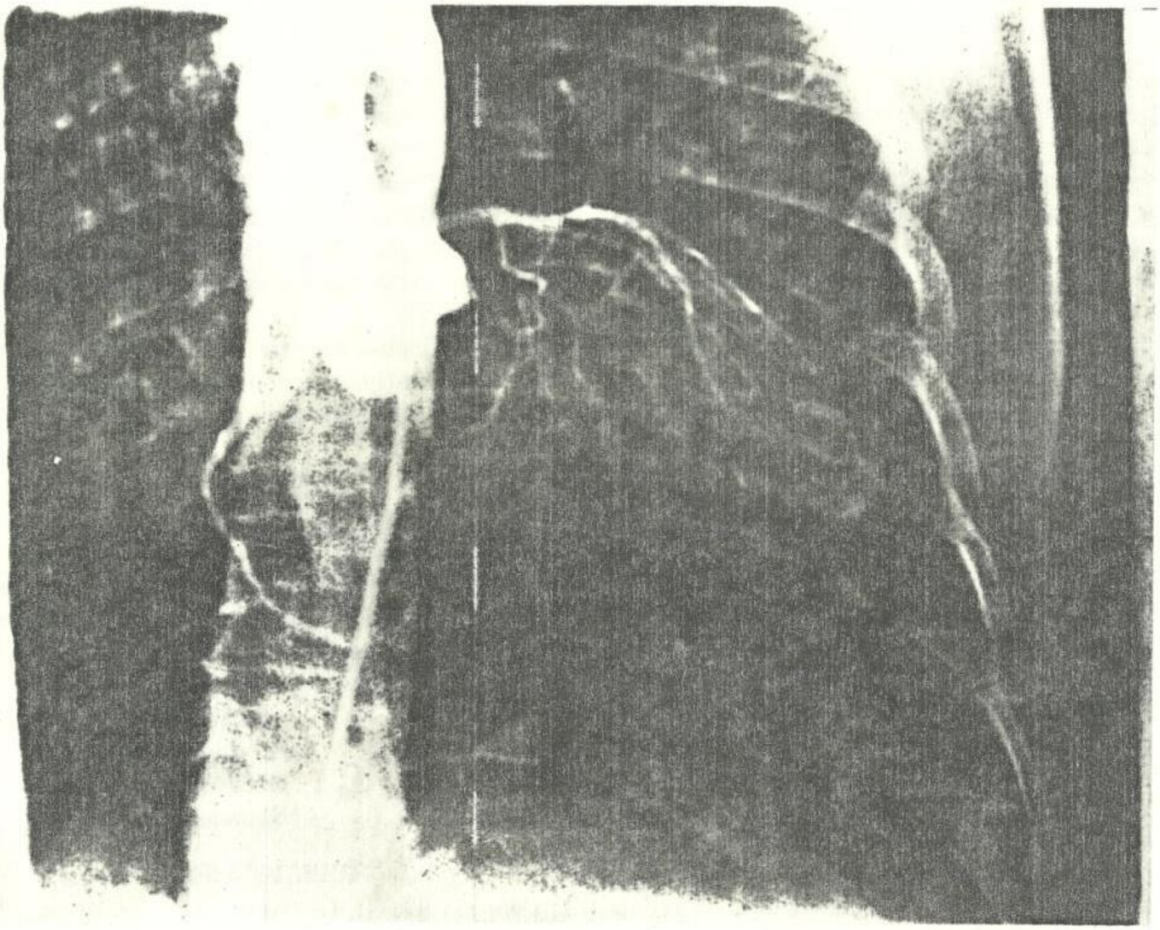


FIG. 4. D.S.L. Coronary arteriogram, A-P view, 5 min. after a second 5-mg sublingual tablet of isosorbide dinitrate.

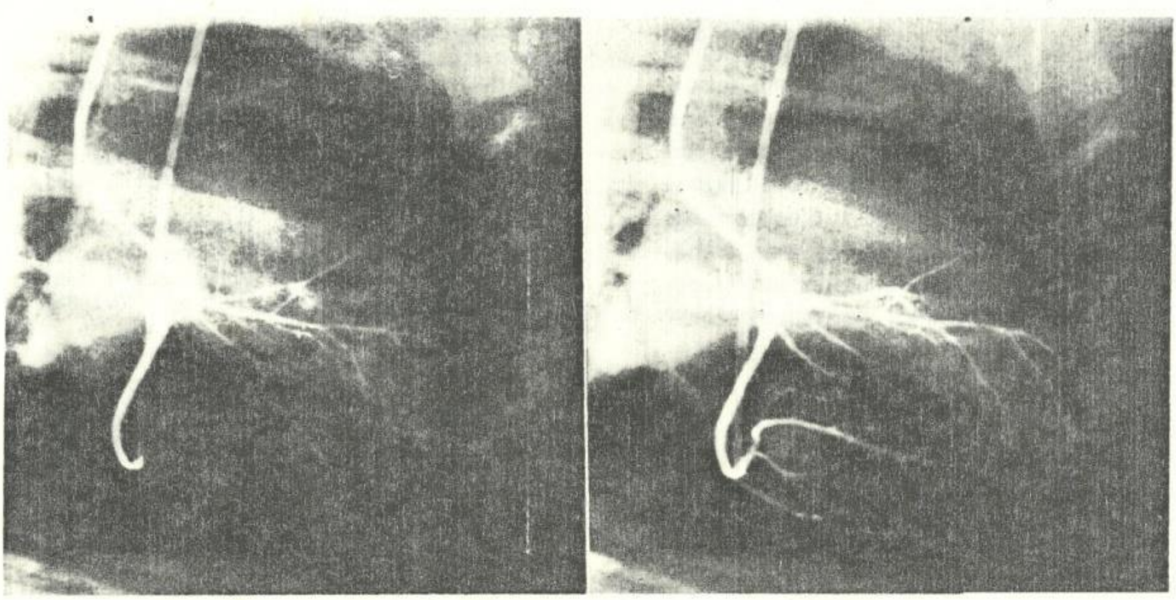


FIG. 5. Selective coronary arteriogram in dog 050, lateral view. *Left*, after 2 units of Pitressin. *Right*, after 5 units of Pitressin and 2 mg isosorbide dinitrate. Renografin-76, 4 cc, was injected each time in the main left coronary artery under equal pressure and identical flow rates. The time delay between injection and x-ray films is equal in both conditions.

completely free from pain, showed good filling of both coronary arteries, which were satisfactorily visualized down to their secondary and tertiary branches. We interpreted this arteriogram as showing moderate atherosclerotic changes.

On May 17, 1962, the patient successfully underwent a cardiopericardiopexy procedure with satisfactory subjective improvement. At the time of the operation, the coronary arteries were carefully explored by inspection and palpation which confirmed our impression of moderate atherosclerotic involvement.

DISCUSSION

Two factors seem to make this case of special interest: the arteriographic demonstration of severe but transient coronary artery spasm in the presence of moderate arteriosclerotic changes and the release of this spasm after administration of a coronary vasodilator.

The point cannot be excluded that this spasm of the coronary arteries might have been initiated by the injection of contrast material. However, this phenomenon had never been observed before by us, and, regardless of the cause, it seems evident that the coronary arteries of this patient were inclined to respond with spasm to various kinds of stimuli.

The sequence of anginal pain, arteriographic demonstration of spasm, administration of a vasodilator, disappearance of pain and disappearance of spasm seemed to justify a clear causal relationship between the vasodilator, the resolution of the spasm and the relief from angina. However, it was rather difficult to accept fully this concept on the basis of an isolated case. Thus, in a series of 15 dogs, as part of a wider investigation to be reported elsewhere,[3] we induced coronary artery spasm by injecting Pitressin[4] into the main left or the circumflex coronary artery (in doses varying from 0.5 to 30 units). The presence of significant narrowing of the coronary arteries to the point of complete lack of opacification of a major branch after selective injection of Pitressin was readily shown by arteriography (fig. 5, *left*).

Isordil injected into the same artery promptly and consistently relieved the vasoconstriction induced by the Pitressin (fig. 5, *right*).

SUMMARY

We have presented a case of angina pectoris with arteriographic demonstration of spasm of the coronary arteries. Experimental evidence has been offered favoring a causal relationship between the release of this spasm and the administration of a new coronary vasodilator.

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REFERENCES

1. Gensini, G. G., Di Giorgi, S., and Black, A.: New approaches to coronary arteriography. Angiology, **12:** 223, 1961.
2. Dotter, C. T., and Gensini, G. G.: Percutaneous retrograde catheterization of the left ventricle and systemic arteries of man. Radiology, **75:** 171, 1960.
3. Gensini, G. G., Di Giorgi, S., and Murad-Netto, S.: The transmission of the coronary artery pressure across the capillary bed of the heart. Presented at the Tenth Scientific Meeting of the International Cardiovascular Society, Chicago, June 23, 1962. Arch. Surg., in press.
4. Green, H. D., Wegria, R., and Boyer, N. H.: Effects of epinephrine and Pitressin on the coronary artery inflow in anesthetized dogs. J. Pharmacol. & Exper. Therap., **76:** 378, 1942.

Ao mestre Murad

Goffredo Gensini, MD (1928–1986)

C. RICHARD CONTI, MD

On October 20, 1986, Goffredo Gensini, MD, died at his home in Syracuse, New York, at the age of 59 years. Those close to him knew that he had pulmonary hypertension, probably secondary to multiple pulmonary emboli. Dr. Harvey Kemp, from New York City, expressed the opinion that it was related to the long flights from Syracuse New York, to Panama, where he had an island home. Kemp, a close friend of Gensini, recalls him as a person who had a "distinct flair about him, which was reflective in his style of dress which tended toward the open collared shirt with the colorful sash for a necktie and the fitted Italian jackets." Until his untimely death, Gensini participated actively as a member of the New York state cardiac advisory committee. Those of us who knew Gensini also knew his wife of 34 years, Ena. She was his constant traveling companion.

One of his early mentors, Dr. Gilbert Blount, considered Gensini one of the brightest young men in his training program. Dr. Blount, who remained a close personal friend, relates a story about Gensini as a teenager. He recalled that in the summer of 1944, the Fifth Army liberated Gensini's home town in Italy. The army was attempting to reclaim a wooded area Northwest of Voltera and many young Italians were used as "mine detectors." During the early days of August, near St. Vivaldo, Florence, a mine exploded and he was wounded and hospitalized.

Gensini entered the University of Florence Medical School and graduated at the age of 24. He came to the United States supported by a Fulbright scholarship and was assigned to the University of Colorado Medical Center in September 1952. Dr. Blount offered Gensini a position in his developing cardiovascular laboratory and he remained there, eventually becoming Assistant Director and then Director of the Cardiovascular Pulmonary Laboratory at the National Jewish Hospital in 1956. In 1958, he moved to Syracuse to become Director of the Monsignor Toomey Cardiovascular Laboratory and Research Department at St. Joseph's Hospital in that city. He remained in that position until his death.

Dr. William Sheldon, Director of Cardiology at the Cleveland Clinic Foundation, relates that as a result of a close relation with Mason Sones, Gensini became one of the "first to carry the message of selective coronary arteriography to parts of the country outside of Cleveland." Dr. Sheldon writes that "his laboratory was first class almost from the start. Even in the early days he sought to streamline the reporting system and achieve conformity in coronary artery nomenclature." This led him to explore computerized reporting systems long before it was fashionable to do so.

Gensini was one of the founding members of the Society for Cardiac Angiography and became one of its enthusiastic leaders. He was elected President of that organization from 1980 to 1981. He shared the concern of many cardiologists that too many angiograms were being recorded in too many patients by too

Goffredo Gensini, MD

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many unqualified angiographers with inadequate facilities, quality control and follow-up. Dr. Sheldon stated that "Goffredo Gensini was one of the leaders among the first generation of angiographers. His text book is, without question, the most complete and most valuable reference on the subject of coronary angiography."[1]

Gensini was also an innovator. He developed the "Gensini" percutaneous catheter that allowed percutaneous catheterization and angiography of the left ventricle.[2] He had the vision that quantitative coronary angiography was important. Long before it was fashionable to attempt quantitation of coronary angiography, Gensini and colleagues developed a system in which angiographic data were stored on computer cards.[3,4] This system was designed by Gensini and took into account the geometrically increasing severity of narrowings as percent reduction of the luminal diameter, their cumulative effect when multiple, the significance of their location, the modifying influence of collaterals,[5] and the ability of the artery to accept and sustain a bypass graft.

Early in his career, Gensini and colleagues documented an important pathophysiologic phenomenon. In 1962, he reported the appearance of a coronary artery spasm occurring spontaneously in a 49-year-old woman with angina pectoris and minor coronary artery disease, and the resolution of this spasm after administration of isosorbide dinitrate.[6,7] The first angiogram recorded during a typical angina crisis showed lack of visualization of the greatest portion of the right coronary artery and poor filling of the left. The second injection, given 3.5 minutes after the administration of 5 mg of sublingual isosorbide dinitrate, revealed opacification of the entire right coronary artery. The left coronary artery, however, was still poorly visualized. The third and last injection, given after administration of a second dose of vasodilator (the patient was free of pain at this point), showed good filling of both coronary arteries down to the secondary and tertiary branches. Based on these and similar early observations, Gensini concluded that coronary artery spasm may occur[1] as a consequence of catheter manipulation,[2] spontaneously in arteries that are either normal or minimally narrowed, and[3] superimposed on severe organic narrowings. In those early days of coronary angiography, he prophetically observed that coronary spasm often extends well beyond the arterial segment touched by the catheter, arteries may be completely or nearly occluded with obvious hindrance to blood flow, pain or ST-segment changes, or both, are usually associated with the appearance of the spasm, and nitroglycerin is highly effective in relieving the spasm (occasionally, more than 1 nitroglycerin tablet may be needed).

Although Goffredo Gensini maintained an active private practice in Syracuse, New York, he was also Clinical Professor of Medicine at the New York Upstate Medical Center. He liked to share his knowledge of the coronary circulation with all levels of students. He was an excellent teacher, clinical investigator and clinical cardiologist. His book *Coronary Arteriography in 1975* was a classic. Goffredo Gensini was Italian by birth and American by choice. In my view, he was a Renaissance cardiologist. He would have liked being called that!

References

1. Gensini GG. *Coronary arteriography*. Mount Kisco, NY: Futura, 1975.
2. Gensini GG. *A new Teflon catheter for percutaneous catheterization and contrast material injection. Radiology* 1963;81:939-941.
3. Gensini GG, Kelly AE. *Computer application in clinical and cineangiographic studies. Chest* 1970;57:131.
4. Gensini GG, Kelly AE, DaCosta BCB, Huntington PP. *Quantitative angiography: the measurement of coronary vasomobility in the intact and flows in coronary arterial disease. Ann Thorac Surg* 1973;15:256-262.
5. Gensini GG, DaCosta BCB. *Coronary collateral circulation in living man. Am J Cardiol* 1969;24:393.
6. Gensini GG, Di Giorgi S, Murad-Netto S, Black A. *Arteriographic demonstration of coronary artery spasm and its release after the use of a vasodilator in a case of angina pectoris and in the experimental animal. Angiology* 1962;13:550-553.
7. Gensini G, DiGiorgi S, Murad-Netto A, Delmonico JE, Black A (1963). *The coronary circulation: an experimental and clinical study. In Memorias del IV Conapreso Mundial de Cardiologia*, 1-A, Mexico: 325-342.