STRESS MYOCARDIAL PERFUSION IMAGING IN
A Patient With Known Coronary Artery Disease

CASE DISCUSSION PROVIDED BY
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Note: Photo does not depict patient in this case study.
INDICATION
Lexiscan® (regadenoson) injection is a pharmacologic stress agent indicated for radionuclide myocardial perfusion imaging (MPI) in patients unable to undergo adequate exercise stress.

IMPORTANT SAFETY INFORMATION

CONTRAINDICATIONS
Do not administer Lexiscan to patients with second- or third-degree AV block or sinus node dysfunction unless these patients have a functioning artificial pacemaker.

WARNINGS AND PRECAUTIONS

Myocardial Ischemia
Fatal and nonfatal myocardial infarction, ventricular arrhythmias, and cardiac arrest have occurred following Lexiscan injection. Avoid use in patients with symptoms or signs of acute myocardial ischemia, for example unstable angina or cardiovascular instability; these patients may be at greater risk of serious cardiovascular reactions to Lexiscan. Cardiac resuscitation equipment and trained staff should be available before administering Lexiscan. If serious reactions to Lexiscan occur, consider the use of aminophylline, an adenosine antagonist, to shorten the duration of increased coronary blood flow induced by Lexiscan.

Sinoatrial and Atrioventricular Nodal Block
Adenosine receptor agonists, including Lexiscan, can depress the SA and AV nodes and may cause first-, second-, or third-degree AV block, or sinus bradycardia requiring intervention. In postmarketing experience, heart block (including third degree), and asystole within minutes of Lexiscan administration have occurred.

Hypersensitivity, Including Anaphylaxis
Anaphylaxis, angioedema, cardiac or respiratory arrest, respiratory distress, decreased oxygen saturation, hypotension, throat tightness, urticaria and rashes have occurred. In clinical trials, hypersensitivity reactions were reported in fewer than 1 percent of patients.

Hypotension
Adenosine receptor agonists, including Lexiscan, induce arterial vasodilation and hypotension. The risk of serious hypotension may be higher in patients with autonomic dysfunction, hypovolemia, left main coronary artery stenosis, stenotic valvular heart disease, pericarditis or pericardial effusions, or stenotic carotid artery disease with cerebrovascular insufficiency. In postmarketing experience, transient ischemic attacks, seizures and syncope have been observed.

Hypertension
Adenosine receptor agonists, including Lexiscan, may result in clinically significant increases in blood pressure in some patients. In postmarketing experience, cases of potentially clinically significant hypertension have been reported, particularly in patients with underlying hypertension and when low-level exercise was included in the MPI.

Bronchoconstriction
Adenosine receptor agonists, including Lexiscan, may cause dyspnea, bronchoconstriction and respiratory compromise. Appropriate bronchodilator therapy and resuscitative measures should be available prior to Lexiscan administration.

ADVERSE REACTIONS
The most common adverse reactions (≥5%) to Lexiscan are dyspnea, headache, flushing, chest discomfort, angina pectoris or ST-segment depression, dizziness, chest pain, nausea, abdominal discomfort, dysgeusia, and feeling hot. Most adverse reactions began soon after dosing, and generally resolved within approximately 15 minutes, except for headache, which resolved in most patients within 30 minutes. Aminophylline was used as a reversal agent in 3% of patients.

In postmarketing experience, the following adverse reactions have occurred: myocardial infarction, cardiac arrest, ventricular arrhythmias, supraventricular tachyarrhythmias including atrial fibrillation or flutter, heart block, asystole, marked hypertension, hypotension, seizure, syncope, QTc prolongation, tremor, abdominal pain in association with nausea, vomiting, or myalgias, diarrhea, fecal incontinence, wheezing and musculoskeletal pain.

PLEASE SEE FULL PRESCRIBING INFORMATION AT WWW.LEXISCAN.COM.
PATIENT PRESENTATION AND HISTORY

A 76-year-old man presented to the emergency department with chest pain and shortness of breath on exertion. The patient’s weight was 175 lb, his height was 69”, and his body mass index (BMI) was 26.3 kg/m². He had undergone coronary artery bypass grafting approximately 12 years earlier (1997): right internal mammary artery (RIMA) to left anterior descending artery (LAD)/first diagonal (D1), and saphenous vein graft (SVG) to right coronary artery (RCA). The following year, he experienced non-ST elevation myocardial infarction and underwent bare-metal stent placement in the ramus intermedius and plain old balloon angioplasty (POBA) in the SVG-RCA anastomosis.
The patient’s history also included hypertension, hyperlipidemia, polycythemia vera, and benign prostatic hyperplasia. His current medications included isosorbide mononitrate, losartan, atorvastatin, metoprolol succinate, clopidogrel, aspirin, hydroxyurea, and tamsulosin.

The patient’s lab results were: cholesterol—total 93 mg/dL, HDL-C 24 mg/dL, LDL-C 50 mg/dL, and TG 93 mg/dL; glucose 117 mg/dL, HbA1c 5.7%; Cr 0.83 mg/dL; CRP 3.5 mg/L. His electrocardiogram (ECG) showed normal sinus rhythm and right bundle-branch block.

STRESS MYOCARDIAL PERFUSION IMAGING (MPI)

The patient was unable to exercise adequately and was referred for pharmacologic stress MPI, and Lexiscan was chosen as the stress agent. Lexiscan is a pharmacologic stress agent indicated for radionuclide MPI in patients unable to undergo adequate exercise stress.

The patient had a resting HR of 78 bpm, which increased to 102 bpm after Lexiscan administration. His blood pressure was 160/90 mm Hg at rest and increased to 179/90 mm Hg after Lexiscan. He developed 3/10 chest and throat discomfort and showed no ECG changes indicative of ischemia.

The rotating projection images showed no motion or attenuation, and there was good liver clearance and no interfering gastrointestinal activity. The patient’s heart size was normal, and no extracardiac abnormalities were observed (Figure 1).

SAFETY CONSIDERATIONS

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Myocardial Ischemia: Fatal and nonfatal myocardial infarction, ventricular arrhythmias, and cardiac arrest have occurred following Lexiscan injection. Avoid use in patients with symptoms or signs of acute myocardial ischemia, for example unstable angina or cardiovascular instability; these patients may be at greater risk of serious cardiovascular reactions to Lexiscan. Cardiac resuscitation equipment and trained staff should be available before administering Lexiscan. If serious reactions to Lexiscan occur, consider the use of aminophylline, an adenosine antagonist, to shorten the duration of increased coronary blood flow induced by Lexiscan.
The perfusion and gated images revealed apical and inferior wall peri-infarct ischemia as well as basal and midcavity inferior infarction (Figure 2). The global left-ventricular ejection fraction was 69%. Inferior wall hypokinesis is also present. The patient was referred for coronary angiography.

Figure 2. Gated single-photon emission computed tomography (SPECT) images at rest and with Lexiscan stress.
CORONARY ANGIOGRAPHY

Coronary angiography revealed proximal occlusion of the native coronary vessels. The SVG-RCA showed 80% distal occlusion, and the right posterior ventricular branch had 50% occlusion in the mid region. The RIMA to the mid-LAD skip and the graft to D1 was widely patent. However, the distal LAD, after the anastomosis, showed diffuse disease and provided distal RCA collateral flow. The left internal mammary artery to the obtuse marginal was widely patent. Ejection fraction assessed by left ventriculography was 50%, with trivial mitral regurgitation and moderate hypokinesis of the inferior wall.

DISCUSSION AND MANAGEMENT

The patient was unable to exercise adequately and was referred for pharmacologic stress MPI and Lexiscan was the chosen agent.

MPI in this patient revealed peri-infarct ischemia, and he was referred for percutaneous coronary intervention. After identification of the involved native vessel/vein graft, a drug-eluting stent was successfully placed in the SVG-RCA (2.5 x 13 mm).