Introduction
Double inter-atrial septum (DIS) is a very rare congenital anomaly, with only a handful of case reports to date. The management of incidental intraoperative finding of DIS is unclear. We present a case of an incidental finding of a DIS during a mitral valve repair, a review of the echocardiographic findings, differential diagnosis and management of DIS.

Case
A 78 year old female who presented with progressively worsening shortness of breath was brought to the operating room for a redo mitral valve replacement (MVR). The patient had a MVR through a left atriotomy approach eight years prior with no history of percutaneous cardiac interventions. After an uneventful induction of anesthesia, an intraoperative trans-esophageal echocardiogram was performed, which showed the presence of a DIS, with a cavity appearing within the septum, best visualized in the mid-esophageal bicaval views. A color flow Doppler exam showed flow within the cavity, appearing to originate from the left atrial side (figure 1). After discussing the findings with the surgical team, a decision was made not to repair the septal anomaly.

Discussion
DIS is a rare anomaly, which is believed to arise from an incomplete fusion of the septum primum and septum secondum. During normal development of the atrial septum, perforation of the primum septum and resorption of most of its superior portion occurs. It is believed that failure of this perforation and subsequent resorption could lead to DIS with a persistent inter-atrial space (1), although definitive etiology remains controversial.
DIS can be confused with other congenital anomalies such as cor triatriatum or aneurysmal inter-atrial septum (IAS). Unlike cor triatriatum, in DIS, the accessory membrane lies parallel to the inter-atrial septum, and there is a free communication of the mitral valve and left atrial appendage with the pulmonary veins (2). Aneurysmal IAS, defined as a localized out pouching of a portion of the atrial septum that protrudes at least 10mm, is different from DIS in that there is no inter-septal cavity due to the presence of a second septum. Iatrogenic causes such as dissection of septum after previous percutaneous cardiac intervention should also be ruled out. The low flow state present in the cavity between the septa in DIS has the potential to be a source of emboli and can result in stroke (3). Given the potential for stroke, the need for intraoperative surgical fusion of the two septa in an incidental intraoperative finding of DIS is unclear. To our knowledge there are no published criteria for surgical excision of a vascular space with low flow state. To date there is only one case report of a prophylactic surgical repair of DIS in an otherwise asymptomatic patient (1).

Reference
Figure 1. Intraoperative TEE. Arrow in figure 1a shows double inter-atrial septum. Doppler flow study shows flow in cavity appearing to originate from left atrium.