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Absent Gastric Bubble: It's Implications on Intra and Post-op Recovery in CABG Patients

Rupinder Kaur Kaiche[1], Amol Shinde[2], Rahul Kaiche[3], Amogh Jagtap[4]

Author's Affiliation: [1]Consultant, Department of Cardiac Anesthesiologist, [2]Consultant, Department of Cardiothoracic and Vascular Surgeon, [3]Consultant, Department of Medicine, [4]Consultant, Department of Radiodiagnosis, Ashoka Medicover Hospital, Nashik, Maharashtra 422209, India.

Corresponding Author: Rupinder Kaur Kaiche, Consultant, Department of Cardiac Anesthesiologist, Ashoka Medicover Hospital, Nashik, Maharashtra 422209, India.

E-mail: rrkaur8@gmail.com

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Abstract

Background: Absent gastric bubble was an X-ray chest finding preoperatively of a 68 year old gentleman posted for CABG. Apart from symptoms of unstable angina consistent with his angiographic findings, he complained of chest pain at night and lump in throat which we could attribute to gastroesophageal reflux disease. The aim of this study was to find the causes of absent gastric air bubble, so as to understand its implications and prevent the possible complications in patients undergoing CABG.

Methods: All patients undergoing cardiac surgery underwent prescribed blood investigation, ECG, X-ray chest (PAview) PFT, carotid doppler, 2D ECHO and coronary angiography. Over a period of 6 months we had 5 patients whose X-ray chest showed absent gastric air bubble. All of the 5 patients were evaluated and managed preoperative,intra and postoperative keeping in mind the possible complications.

Results: Cause of absent gastric bubble in our patients:

1. Hiatus hernia -1
2. Achalesia cardia -1
3. Gastro-esophegael reflux disease -3

Conclusion: Absent gastric bubble is a sign which needs to be investigated pre-operatively for its cause. Gastro-esophageal reflux disease is a common disease which mimics heart attack.1. and is common in patients coming for CABG and can be a cause for concern for patient due to persistent chest pain post surgery. Adequate precautions like duration of fasting preop-operatively, prevention of micro aspiration post-operatively with head end elevation and low fat diet, abstinence from smoking, tea, coffee intake, weightloss will help in relieving symptoms of GERD and improve patient satisfaction post CABG. Confirmation and explanation of the observed relation between the presence of hiatal hernia and infarction requires further research .

Keywords: Gastric air bubble; Ggastro-esophageal reflux disease; Hiatus hernia; Achalasia cardiac.

Introduction

Chestpain is a symptom not only signalling angina but also gastroesophageal reflex disease.[1] The latter can be easily correlated with a lesser appreciated gastric bubble on chest radiograph. Abnormalities in the position or shape of the gastric bubble may be the initialor sole manifestation of thoracic or abdominal pathology. In 1939 Kirklin emphasized the importance of evaluating the gastric bubble for

Table 1: Compilation of patients demographics, comorbidities, operative details, postoperative complications, ICU and hospital stay.

Gender	Female	Female	Male	Male	Female
Diagnosis	IHD,CAD,Critical DVD, USA, RT ICA-100%, LT CCA-70%	IHD,CAD, TVD,USA, RWMA	IHD, CAD, TVD, USA, RWMA	IHD, CAD, Critical TVD with LMCA, CCF, PWMI, MOD MR,LTCA-60%	IHD, CAD, Critical SVD, Large Lamyxoma,SEV PH, SEV TR,SEV RV Dysfunction
Co-morbidities	HTN,Carotid artery stenosis, GERD	HTN, Type 2 DM, GERD	COPD, Achalasia cardia	COPD, GERD	Hiatus hernia
Surgery	CABG X2(LIMA VEIN Y)	CABG X 2 (VEIN)	CABG X 3(LIMA VEIN)	CABG X 3 (LIMA VEIN)	CABG X 1 + LA MY X OMA Exclision(Vein)
LVEF	40%	50%	45%	40%	50%
Post -OP Complications	Nil	Nil	Nil	Nil	Nil
ICU stay	2 days	2 days	2 days	2 days	3 days
Hospital stay	7 days	7 days	7 days	7 days	8 days

deformities produced by carcinoma in cardia or fundus.[2] Though the likelihood of detecting occult gastric carcinoma on a chest radiograph is small,it is an important indicator of pathologies causing GERD.

X-ray chest is one of the routine investigations done for all cardiac patients prior to surgery for systematic evaluation of trachea, fats and subcutaneous tissue, soft tissue like heart, lungs, bony structures like clavicle, ribs, vertebrae and the presence of metallic objects like defibrillator or pacemaker. We also look for the gastric air bubble.

We present a case series of 5 patients who underwent cardiac surgery with pre-operative X-ray chest showing absent gastric bubble. They were evaluated pre-op for the cause, and managed pre-operatively, intra and post operatively to avoid any complications.

Methods

A 68 years old gentleman posted for CABG showed absent gastric air bubble on his pre-operative X-Ray (Fig.1) On analysing his symptoms given in history during pre-anaesthetic evaluation some like chest pain at night and lump in the throat were attributed to gastro-esophageal reflux. On further evaluation and discussion with gastro-enteroenterologist, he was diagnosed as sufferring from GERD. This prompted us to evaluate, over a period of 6 months, 4 more patients whose X-ray showed absent gastric air bubble. Proper history taking, investigations with the involvement of radiologist and gastroenterologist, helped us reach a diagnosis in each case. Necessary pre-operative, intra and post-operative precautions and appropriate management helped us anticipate and prevent any complications.

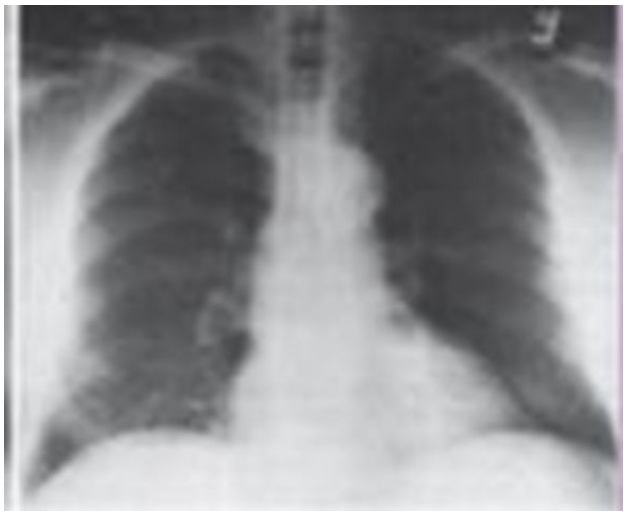

Fig. 1: Absent gastric air bubble on his pre-operative X-Ray

Results

(Table 1) shows a compilation of patients demographics, comorbidities, operative details, postoperative complications, ICU and hospital stay. Patients can have complications which can affect morbidity. Our pre-operative precautions helped prevent them.

Discussion

Absent gastric bubble is a sign which can relate to many causes, the prominent and common being:

A. GERD

B. Hiatus hernia

C. Opiate induced oesophageal dysmotility

D. Achalasia cardia.

GERD: Gastro esophageal reflux disease is the transient relaxation of lower esophageal sphincter causing the gastric acid to regurgitate into the esophagus. This gives rise to symptoms of heart burn, chest pain at night, difficulty swallowing, sensation of lump in the throat. Night time acid reflux may cause chronic cough, laryngitis, new or worsening asthma and disrupted sleep.

Some of the symptoms overlap with symptoms of coronary artery disease as shown in our patients taking the form of "heart mask". Korronek et al. attempted to find the relation between GERD and CAD and found that 34% of CAD patients showed symptoms of GERD.[1].Smoking, intake of alcohol, coffee, fatty foods,obesity are some of the aggravating factors which are modifiable. These patients are advised early dinner, lifestyle modifications and raised head end of bed while sleeping.

GERD increases acid exposure on vulnerable epithelia usually esophagus, but may include supraesophageal terrain including larynx, pharynx andairways.[4]

Hiatus Hernia: Anytime an internal body part pushes into an area where it doesn't belong is called hernia. Hiatus is an opening in the diaphragm. Normally the esophagus goes through the hiatus and attaches to the stomach. Commonly the stomach bulges into chest. The paraesophagealhernia though less common is of concern. In this the esophagus and stomach stay in their normal location but part of stomach squeezes through the hiatus landing it next to esophagus. The danger is that the stomach can become strangulated or have its blood supply shut off. People with hiatus hernia have no symptoms other than heart burn related to GERD. There is a significant coincidence between hiatal hernia and esophageal reflux disease.[3] Hiatal hernia can be viewed as a continium of progressive disruption of gastrointestinal esophageal junction, highlights the difficulty of elucidating the relation between hiatalhernia, the diaphragmatic hiatus, the lower esophageal sphincter and GERD, including supraesophagael reflux.

Achalasia Cardia: It is characterized by failure of lower esophageal sphincture to relax in response to swallowing and by an absence of peristalsis in esophageal body. It is an esophageal motor disorder whose major symptom is dysphagia which results from in effective transport of swallowed material from mouth to stomach. Since swallowed air is largely responsible for gastric air bubble on chest X-ray, an impairment of air transport may alter this finding. Recent evidences indicate that this anautoimmune process triggered by some viruses like herpes virus in genetically predisposed individuals resulting in degeneration of myenteric neurons.[5]

Gastroscopy is recommended to rule out other causes of dysphagia, especially pseudo achalasia due to gastro esophageal junction neoplasms.

Treatment modalities include:

1. Botulinum toxin injection
2. Pneumatic balloon dilation
3. Laproscopic Heller myotomy
4. Per oral endoscopic myotomy (POEM)

Other conditions which may present like achalasia cardiac are:

1. Esophageal cardia
2. Esophageal structure
3. Gastro-esophageal reflux disease
4. Plummer Vinson syndrome
5. Rozyeki syndrome
6. Chagas disease

Complications of long standing achalasia which need to be considered are:

A. Aspiration pneumonia

B. Oesophagael cancer

C. Candida esophagitis

D. Acute airway obstruction

Opiate induced esophageal Dysmotility: Opioids are known to delay intestinal transit time. This occurs by stimulation of non propulsive contractions in intestine and colon via central and peripheral actions.[6]. μ,δ and κ receptors are present in central as well as enteric nervous system, more of μ and κ in enteric system.[7]. Opioid receptors are also present in the esophagus.[8] Use of opoids cause generation of high amplitude and simultaneous esophageal waves causing impaired lower esophageal sphincter relaxation. Morphine is known to decrease lower esophageal sphincter relaxation.[9]

With increasing incidence of cancer, osteo-arthritis, chronic back pain, the use of opioids has increased, which can be the cause of esophageal dysmotility.

Since the various causes giving rise to absent gastric air bubble are all inter-related, the

complications caused are similar. Knowledge, prevention, anticipation and prompt management helped us avoid serious complications like acute airway obtruction, aspiration pneunomia. All our patients were kept overnight fasting for 10–12 hours and taken up as first case in the morning. Rocuronium was used as muscle relaxant to facilitiate early intubation. Post-operatively head end of the bed was kept elevated.[10,11] It was communicated to all doctors and nurses involved with patient care throughout the hospital stay to avoid supine position.[12] RT was placed. Opioids were replaced by paracetamol and tramadol for pain relief.[13] H_2–receptor blockers were started. They were discharged with advise regarding life style modifications.

Conclusion

Gastric bubble is an occasionally neglected sign which can give important information in the preoperative period. Patients with cardiac disease tend to overlook symptoms pertaining to GERD, however it's persistence post-operatively becomes their source of concern. Its pre-operative diagnosis,treatment with adequate precautions can improve morbidity and patient satisfaction.

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