AORTIC ANEURYSM

AS A CAUSE OF HYPERTROPHY OF THE LEFT VENTRICLE

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SOME authorities state that aortic aneurysm is a cause of hypertrophy of the left ventricle, and others are equally positive that it is not. This conflict of opinion is embarrassing to the teacher and confusing to the student.

I have therefore thought it worth while to see what light the post-mortem records of St. Bartholomew's Hospital throw upon the subject, and my examination of the "Record of Complete Cases" has been made a comparatively easy task by Dr. Oswald Browne's recent dissertation for the degree of M.D. at Cambridge, entitled "Aneurysms of the Aorta."¹

Dr. Browne's thesis is based "upon an analysis of all cases of aneurysm of the aorta in any of its parts dying in St. Bartholomew's Hospital during the last thirty years, upon whom an examination was made after death and its results carefully recorded."

(a) Of the ascending part of the arch he has analysed 58 cases :

¹ 'Aneurysms of the Aorta,' by Oswald A. Browne, M.A., M.D. H. K. Lewis, London, 1897.

In 4 of these the condition of the heart was not recorded in the post-mortem notes.

In 1 case the heart is described in the post-mortem notes as "fatty."

In 27 cases there was no hypertrophy of the left ventricle.

In 26 cases there was hypertrophy of the left ventricle.

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58

(β) Of the transverse part of the arch he has analysed 35 cases :

In 1 of these the description of the heart in the post-mortem notes is "some general dilatation."

In 2 cases the heart is described as "fatty."

In 19 cases there was no hypertrophy of the left ventricle.

In 13 cases there was hypertrophy of the left ventricle.

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(γ) Of aneurysms affecting both the ascending and transverse parts of the arch he has analysed 19 cases :

In 12 cases there was no hypertrophy of the left ventricle.

In 7 cases there was hypertrophy of the left ventricle.

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(δ) Of the descending part of the arch he has analysed 21 cases :

In 1 case the condition of the heart was not recorded in the post-mortem notes.

In 10 cases there was no hypertrophy of the left ventricle.

In 10 cases there was hypertrophy of the left ventricle.

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The particulars of these cases with hypertrophy of the left ventricle, copied from Dr. Browne's tables and retaining his numbering, are as follows :

TABLE I.—*Aneurysms of the First or Ascending Portion of the Arch.*

Ref- er- ence.	Sex.	Age.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
1 I, 201	M.	40	1 inch above aortic valves, arch gradually dilated into a fusiform aneurysm; hence an opening into a sacculus abutting on and almost occluding vena cava superior (A smaller sacculus anteriorly)	Pressure on vena cava superior	Some hypertrophy of left ventricle	Aortic valve thickened	Calcification in wall of sacculus; slight puckering elsewhere	Edema of lungs	Dr. Church.
2 I, 244	M.	49	Greatly dilated ascending aorta, with large sacculated aneurysm in connection with right lateral wall, springing 2 inches above aortic valve A second aneurysm from anterior and left wall just below origin of innominate artery A third, formed by dilatation of aortic wall at commencement of descending portion Two or three further aneurysmal dilatations of abdominal aorta	Occupying anterior mediastinum and right pleural cavity Causing erosion of left side of sternum, 3rd costal cartilage and rib, and absorption of intercostal muscles Slightly eroding vertebræ	Slightly hypertrophied; much dilatation of left ventricle — — —	Healthy — — —	Slight atheroma at commencement — — —	Increasing dyspnoea; collapse and softening of right lung — — —	Dr. Church.

Ref. ence.	Sex.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
5 II, 127	M.	56 Right side of ascending portion	Tumour in anterior mediastinum immediately above pericardium, rupturing through opening there into right pleura	Left ventricle enormously hypertrophied	Aortic valves thickened and incompetent	Ascending and transverse portions greatly dilated	Rupture into right pleural cavity	Dr. Gee.
7 II, 260	M.	36 Right side of ascending portion	Occupying anterior mediastinum; heart depressed; lungs pushed to right and left; vena cava superior and venae innominatee much compressed; some pressure on right pulmonary artery	Some hypertrophy of left ventricle	Healthy	Slight atheroma throughout	? Large serous effusion in both pleural cavities	Dr. Gee.
8 II, 303	M.	32 A slit immediately above valves led directly into aneurysmal cavity	Opening near heart into vena cava superior	Some hypertrophy of left ventricle	Slightly atheromatous	Highly atheromatous	—	Dr. Wickham Legg.
11 III, 313	M.	57 Whole arch greatly dilated to 1 inch below left subclavian; just above one semilunar valve on right anterior aspect of aorta is a ragged opening into pericardium; large vessels not implicated	Trachea much compressed by small pouch from aneurysm; one cartilage eroded; left vena innominate crosses aneurysm	Wall of left ventricle thickened	Healthy	Descending aorta full of bony plates	Rupture into pericardium	Dr. Gee.
12 IV, 114	M.	37 Sacculus behind posterior semilunar valve	—	Great general hypertrophy	Aortic valves incompetent	Slightly dilated	—	Dr. Norman Moore.

15	V, 97	F. 53	Right side of aorta immediately above valves	—	Left ventricle hypertrophied	Aortic valve thickened; mitral atheromatous	Fairly healthy	—	Dr. Wickham Legg.
16	V, 173	F. 40	Immediately above valves	Bulging from right side of this presses much on superior vena cava; a bulging from left side presses on pulmonary artery	Much hypertrophy of left ventricle	Aortic and mitral highly atheromatous, incompetent	Atheromatous throughout	Extreme dyspnoea	Dr. Wickham Legg.
17	V, 275	M. 42	Ascending part of arch 1 inch above valves	Extending forwards and to right, pressing on left side of pulmonary artery, also upon inferior vena cava and superior vena cava	Slight hypertrophy of left ventricle	Healthy	Slight atheroma	—	Dr. Norman Moore.
19	V, 345	M. 37	Aorta dilated immediately above valves; hence lead two sacs, one to right, one from back part of aorta, also bulging to right	This pressed on superior vena cava and ruptured into pericardium	Left ventricle scarcely hypertrophied	Healthy	Some atheroma	Rupture into pericardium	Dr. Wickham Legg.
23	VII, 87	M. 44	Aorta greatly dilated from immediately above valves to origin of innominate; hence a small aneurysmal sac	Tumour projected at upper border of right axilla	Great hypertrophy of left ventricle	Aortic valves incompetent	Highly atheromatous to left subclavian; slightly so beyond	Infarction in both lower pulmonary lobes	Dr. Norman Moore.

Case.	Reference.	Sex.	Age.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
24	VII, 189	M.	45	Large aneurysmal sac above coronary arteries and below innominate artery	Enormous tumour in mid-chest and on right side; right lung firmly adherent and forming wall of cavity; second, third, and fourth ribs much eroded, with much of upper part of sternum	"Of little more than normal size"	Healthy	Highly atheromatous	? Large double pleural effusion	Dr. Norman Moore.
25	VII, 259	M.	27	Small aneurysm between orifices of coronary arteries	Pointing towards pulmonary artery and pressing upon it just above valves	Left walls hypertrophied; weight 3 lbs.	Aortic valves thickened, incompetent	Arch highly atheromatous	? Œdema of lungs	Dr. Ormerod.
26	VII, 293	M.	54	Large aneurysm of anterior part of ascending portion, with fusiform extension up innominate artery; a small additional sac beyond left subclavian	Tumour adherent to chest wall from third left rib upwards; left lung retracted and adherent to back of tumour; calibre of main pulmonary artery and of its left branch narrowed; left vagus nerve also compressed	Hypertrophy of left ventricle	Aortic valves thickened	Highly atheromatous	—	Dr. Norman Moore.
28	VIII, 341	F.	15	Between attachment of pericardium and origin of innominate artery; great vessels natural	Tumour covered ascending aorta	Wall of left ventricle thickened	Mitral stenosis; aortic cusps adherent	Healthy	—	Dr. Ormerod.
29	X, 104	M.	40	Aorta dilated into aneurysmal sac just above valves	Bulk of sac lay behind and to left of vessel; communication with pulmonary artery; no external tumour	Heart very flabby; weight 14 oz.	No note	Not elsewhere atheromatous	Rupture into pulmonary artery	Dr. Tooth.

30	XI, 47	M.	63	Small bulging immediately above valves; fusiform aneurysm 2 inches above bifurcation of aorta	—	Weight 18 oz.	Healthy	Atheromatous	—	Dr. Norman Moore.
33	XII, 49	M.	31	1½ inches above valves	Forwards, penetrating sternum; manubrium eroded; external tumour over sternum at level of second rib	Slight hypertrophy of both ventricles	Healthy	Much atheroma for 1½ in. above valves, not elsewhere	Urgent dyspnoea	Dr. Norman Moore.
35	XII, 181	F.	46	Immediately above aortic valves	Wholly within pericardium	Some general hypertrophy, especially of left ventricle	Aortic valves thickened	Highly atheromatous	—	Dr. Norman Moore.
36	XII, 205	F.	35	Immediately above aortic valves, not involving sinuses of Valsalva	Backwards and to right; right bronchus slightly flattened; no external tumour	General hypertrophy and dilatation	Healthy	Atheromatous	? Right pleural effusion; thrombosis of right brachial and both femoral veins	Dr. Ormerod.
46	XIX, 297	M.	—	Just above aortic valves	A secondary pouch pressed upon pulmonary artery just above valves	Dilated, flabby; weight 24 oz.	Incompetent	Atheromatous	Increasing dyspnoea	Dr. Ormerod.
47	XX, 330	M.	53	Large aneurysm arose from anterior wall of ascending arch	Sac adherent to right lung and to first and second right costal cartilages close to sternum; no erosion	Hypertrophy of left ventricle	Aortic valves thickened	Atheromatous	Rupture into right pleural cavity	Dr. Tooth.
48	XX, 365	M.	50	Small sacular aneurysm about 2 inches above valves	No external tumour	Much hypertrophy	Healthy	Highly atheromatous throughout	Œdema of lungs	Dr. Tooth.

Reference.	Sex.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
30. XXI, 75	M.	Aneurysm of ascending part of arch	Communicated by two small openings with pulmonary artery; no external tumour	Left ventricle hypertrophied	Aortic valve thickened	Atheromatous	—	Dr. Tooth.
32. XXI, 293	M.	Aneurysmal dilatation of ascending arch	Principally to right; no visible tumour	Hypertrophy and dilatation of left ventricle	Aortic valve incompetent; cusps much diseased	Atheroma of ascending arch	Heart failure	Dr. Tooth.
6. I, 286	M.	Aorta immediately above valves dilated into large globular sacculus with aberrant aortic walls; 3 inches above valves oval opening leads into pouch, of which walls formed by connective tissue surrounding this part of arch	Anterior wall of tumour adherent to depression in sternum at junction of 3rd left costal cartilage; some compression of vena cava superior; parts of wall firmly adherent to pericardium; right lung collapsed	Left ventricle hypertrophied	Healthy	Atheromatous	? Edema of lungs	Dr. Church.
7. II, 173	F.	Rupture through inner and middle coats at origin of innominate artery; external coat quite separated from middle coat, blood-clot intervening	Rupture into pericardium at right side of aorta, just where arising from heart	Left ventricle somewhat hypertrophied	No note	Atheromatous	Rupture into pericardium	Dr. Gee.

TABLE II.—*Aneurysms of the Second or Transverse Part of the Arch.*

9	III, 48	M. 39	Sacculus formed by great distension of posterior wall of innominate artery at its origin	Great pressure on anterior wall of trachea; no erosion; left recurrent nerve much flattened	Left ventricle much hypertrophied	Aortic valves thickened, incompetent	Highly atheromatous	Tracheotomy performed for dyspnoea	Dr. Gee.
11	IV, 336	M. 36	Middle portion of arch converted into aneurysmal sacculus; innominate artery had disappeared; right carotid and subclavian spring directly from sacculus	Tumour rises high in neck; presses behind on trachea, which in three spots is ready to burst; left innominate vein obliterated where it crosses sac	Left ventricle much hypertrophied	Fine granulations on aortic valve	Arch dilated and highly atheromatous	Increasing tracheal compression	Dr. Wickham Legg.
14	V, 137	F. 36	Aneurysm of transverse and descending portions; a small sacculus projects from its inner side	Sac and main aneurysm both pressed on left bronchus and on trachea just above bifurcation; wall of trachea eroded; no external tumour	Natural	Healthy	No note	Asphyxia	Dr. Norman Moore.
15	VI, 24	F. 53	Aorta natural to left carotid, there opening into trifid sac	One sac eroded bodies of 3rd and 4th dorsal vertebrae; another opened into bronchial tube 1½ inches below bifurcation of trachea; the 3rd passed into main stem of pulmonary artery	Left ventricle natural	Healthy	Lower part atheromatous	—	Dr. Wickham Legg.
19	IX, 286	M. 41	Aneurysm extended from origin of innominate to left subclavian artery	Projecting mainly forwards through 1st left intercostal space and sternum, and barely covered by thin layer of sternum and of pectoral muscle; contraction of left lung	Slight general hypertrophy	Healthy	Atheromatous throughout	—	Dr. Norman Moore.
21	X, 125	M. 45	First aneurysm projected from arch anteriorly and slightly to right, just below origin of innominate artery; a second projected backwards from arch below, and above origin of left subclavian artery	Bulging inwards of anterior wall of trachea just above bifurcation; pulsation in 2nd left interspace; no external tumour	Slight hypertrophy of left ventricle	Healthy	Great general dilatation, with much atheroma	Sudden dyspnoea	Dr. Norman Moore.

from valves to junction of ductus arteriosus

Ref. ence.	Sex.	Age.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
22	X, 355	M. 66	Whole of transverse and upper part of descending arch dilated into large aneurysmal sac	Part of left lung adherent to sac; left upper lobe full of blood; no external tumour	Weight 20 oz.	Healthy	Highly atheromatous	Death sudden	Dr. Tooth.
24	XI, 168	M. 50	Wide opening into large aneurysmal sac 2½ inches above valves	Projecting <i>forwards</i> in 2nd right intercostal space and there penetrating the muscle, and <i>upwards</i> above episternal notch, and adherent to and pressing forwards upper part of sternum; backwards and to right it compressed right lung, which was adherent to it; sternum eroded from 2nd right costal cartilage to 1st left costal cartilage, especially at right side	Heart slightly hypertrophied	Healthy	First 2 inches atheromatous	Great oedema of arytaeno-epiglotticæan folds, quite closing orifice of larynx	Dr. Norman Moore.
26	XIII, 96	M. 41	Sacculated aneurysm from front of transverse part of arch	Perforation of second bone of sternum on either side, central portion intact; external tumour to left of sternum, opposite 2nd, 3rd, and 4th left costal cartilages, also to right of sternum, at level of 2nd costal cartilage	Slight hypertrophy of left ventricle	Not noted	Very atheromatous	External rupture	Dr. Norman Moore.
32	XXI, 131	M. 58	Large aneurysm of transverse part, involving also large part of descending portion	Aneurysm adherent to upper part of left lung; bodies of dorsal vertebrae—5, 6, 7, 8—much eroded	Weight 12 oz.	Healthy	Highly atheromatous	Rupture into left pleural cavity	Dr. Tooth.

TABLE III.—*Aneurysms of the Ascending and Transverse Portions of the Arch.*

344XXIII, 201	M.	30 Saccular aneurysm arose posteriorly, close to, but not involving, innominate artery	More to left than right of trachea; no external tumour	Enormous hypertrophy and dilatation of left ventricle	Aortic valves incompetent	Very atheromatous	Recurring attacks of dyspnoea	Dr. Garrod.
35XXIII, 312	F.	44 From 1½ inches beyond origin of innominate to just beyond left subclavian artery	Had almost perforated trachea in two places; no external tumour	Some hypertrophy of left ventricle	Aortic valves competent	Atheromatous	Asphyxia	Dr. Calvert.
3VII, 273	M.	39 Aneurysm immediately above valves and extending 1 inch beyond origin of left subclavian	Cavity extended chiefly backwards and upwards against trachea; trachea perforated just above bifurcation	Slight hypertrophy	Healthy	Highly atheromatous	—	Dr. Norman Moore.
4VIII, 292	M.	46 Aneurysm included whole of arch as far as left subclavian, extending anteriorly and posteriorly; funnel-shaped dilatation of left subclavian for 1½ inches from origin	Projection of tumour between 1st and 3rd right ribs; 2nd right costal cartilage and part of sternum eroded; trachea much compressed just above bifurcation, two rings partially eroded; bodies of the two upper dorsal vertebrae eroded on right side	Both ventricles slightly hypertrophied	Healthy	Atheromatous	Increasing dyspnoea	Dr. Norman Moore.
6XI, 267	M.	48 From just above aortic valves to origin of left subclavian	Backwards towards apex of right lung, which was collapsed and adherent to aneurysm; here rupture; tumour projected from 3rd right interspace to clavicle; 2nd rib much thinned	Slight hypertrophy of left ventricle	Healthy	Atheromatous	Rupture into right pleural cavity	Dr. Norman Moore.

TABLE III.— <i>Aneurysms of the Ascending and Transverse Portions of the Arch.</i>								
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Refer- ence.	Sex.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
9 XVI, 81	M.	31 Aneurysm from posterior part of ascending and transverse portions of arch; great vessels not involved	Aneurysm seated on front of trachea, which was not compressed; rupture into tissues in front of trachea; left recurrent laryngeal nerve involved; no external tumour	Left ventricle hypertrophied	Aortic valves thickened	Athero- matous	Trache- otomy performed for urgent dyspnea	Dr. Ormerod.
11 XVIII, 221	M.	38 Ascending and transverse portions of arch; large vessels arose from upper part of sac	2nd right costal cartilage eroded	Left ventricle hypertrophied	Aortic valves incom- petent	Athero- matous throughout	Septic pneumonia	Dr. Ormerod.
12 XIX, 120	M.	60 Aneurysm commenced with- in pericardium, involved whole of arch, terminating just beyond origin of left subclavian; orifices of great vessels normal	None noted	Left ventri- cle hyper- trophied; right side dilated	Healthy	Highly athero- matous	? Right pleural effusion	Dr. Ormerod.
15 XXII, 225	F.	49 Large aneurysm of ascend- ing and transverse portions of arch; innominate and left carotid arteries emerg- ed from sac; left sub- clavian free	Perforated right border of sternum, and second and third right costal carti- lages	Weight 15 oz.; fatty	Healthy	Very athero- matous throughout	Asphyxia	Dr. Garrod.
2 IV, 133	M.	34 Just below origin of left subclavian artery	Pouch lying between aorta and apex of left lung, which formed its anterior wall	Left side of heart hyper- trophied	Healthy	Highly athero- matous	Phthisis; cirrhosis hepatis	Dr. Wickham Legg.

TABLE IV.—*Aneurysms of the Third or Descending Part of the Arch.*

6	VII, 277	M. 42	Just beyond origin of left subclavian posterior surface of aorta bulged into an aneurysm; a slighter bulging on its opposite wall	Sac bursting downwards had dissected mucous from muscular coat of esophagus as far as upper surface of diaphragm, where blood had flowed through a small orifice into left pleural cavity	Left ventricle slightly hypertrophied	Healthy	Highly atheromatous above valves	Rupture into left pleural cavity	Dr. Norman Moore.
7	VIII, 282	F. 43	Aneurysm extended for 2 inches from origin of left subclavian artery	Upper part of left lung forms part of wall of aneurysm, which had ruptured into left pleura	Left ventricle hypertrophied	Healthy	Highly atheromatous	Rupture into left pleural cavity	Dr. Norman Moore.
8	VIII, 309	M. 43	At commencement of descending part just below origin of left subclavian artery	Extending chiefly backwards; left lung firmly adherent to and forming part of aneurysmal wall, as also the much eroded bodies of 4th, 5th, and 6th dorsal vertebrae; rupture through lung into left pleura	Heart "not greatly hypertrophied"	Healthy	Highly atheromatous below aneurysm	Rupture into left pleural cavity	Dr. Norman Moore.
9	X, 365	M. 38	Saccular aneurysm of descending portion	Adherent to inner aspect of apex of left lung; 4th, 5th, 6th, and 7th left ribs eroded; rupture at lower part, close to vertebrae, into left pleural cavity	Weight 13 oz.	Healthy	Some atheroma of arch	Rupture into left pleural cavity	Dr. Tooth.
11	XIII, 71	M. 55	Aneurysm of third part of arch and upper part of descending thoracic aorta	Wall of sac in part formed by tissue of left lung; 3rd and 4th dorsal vertebrae eroded on left side; rupture into left pleura	Slight hypertrophy of left ventricle	Two aortic cusps adherent	No calcification below aneurysm	Rupture into left pleural cavity	Dr. Norman Moore.
15	XX, 366	M. 52	Large fusiform aneurysm of half of transverse and whole of descending part of arch	Aneurysm adherent to left lung; rupture into left pleural cavity	Some hypertrophy of left ventricle	Healthy	Very atheromatous	Rupture into left pleural cavity	Dr. Tooth.

Refer- ence.	Sex.	Age.	Part of aorta affected.	Direction and effects.	State of heart.	State of valves.	State of aorta.	Cause of death.	Observer.
16 XXI, 288	M.	40	Aneurysm of descending part of arch	As arch passed over root of left lung, small loculus compressed left pulmonary artery; lower part of aneurysm adherent to eso- phagus at level of bifurca- tion of trachea; here rup- ture into oesophagus	No marked hyper- trophy of left ventricle	Healthy	Slight atheroma	Rupture into oesophagus	Dr. Tooth.
17 XXII, 334	M.	67	Small aneurysm on right side of lower part of de- scending arch	Sac adherent to right lung; rupture into right lung a little above right bronchus	Much hyper- trophy of left ventricle	Aortic valve thick- ened	General atheroma	Rupture into right lung	Dr. Tooth.
20 XXIII, 288	M.	35	Descending part of arch	Main sac eroded on left side of bodies of 5th, 6th, and 7th dorsal vertebrae A smaller (false) aneurysm had compressed and finally ruptured into left bron- chus; this had also com- pressed and flattened left pulmonary artery	Much hyper- trophy, especially of left ventricle	Aortic valves very incon- petent	Extreme atheroma throughout	Rupture into left bronchus	Dr. Garrod.

In the ascending part of the arch we have 27 cases without hypertrophy, 26 cases with hypertrophy. But with regard to these 26 cases with hypertrophy,—

In Nos. 12, 16, 23, 25, 46, 52 6 cases,
the aortic valves were incompetent.

In Nos. 17, 29, 35 3 cases,
there was adherent pericardium.

In Nos. 8, 24, 26 3 cases,
the aorta is described as highly atheromatous.

And on referring to the post-mortem records I find
that in Nos. 1, 2, 5, 15, 28, 30, 36, 47, 48 . . . 9 cases,
the kidneys were granular.

And on referring to the clinical notes of the case I
find that in No. 50 1 case,
there was well-marked aortic regurgitation. —
22 cases.

(In Nos. 8 and 29 the condition of the kidney is not recorded
in the post-mortem notes.)

Thus the hypertrophy in 22 of the 26 cases can be perfectly explained without the aid of aortic aneurysm.

Four cases remain—Nos. 7, 11, 19, 33:

But in No. 19 the heart is described as “scarcely hypertrophied,”
therefore it may be left out.

In No. 7.—Some hypertrophy of left ventricle; some atheroma
of aorta; kidney natural.

In No. 11.—“Wall of left ventricle rather thick,” “kidneys
indurated as in cardiac disease,” are the expressions used in
the post-mortem records. “Descending aorta full of bony
plates,” so that no doubt there was atheroma elsewhere in
the aorta.

In No. 33.—Slight hypertrophy of both ventricles; kidney
natural; much atheroma for $1\frac{1}{2}$ inches above the aortic
valves.

In each of these 3 cases the hypertrophy is slight, and may probably be accounted for by the condition of the arteries.

In the transverse part of the arch we have 19 cases without hypertrophy, 13 cases with hypertrophy. But with regard to these 13 cases with hypertrophy,—

In Nos. 9, 34	2 cases,
the aortic valves were incompetent.	
In No. 11	1 case,
the aorta is described as highly atheromatous.	
And on referring to the post-mortem records I find	
that in Nos. 6, 7, 16, 22, 26, 32, 35	7 cases,
the kidneys were granular.	—
	10 cases.

Thus the hypertrophy in 10 of the 13 cases can be satisfactorily accounted for without the aid of aortic aneurysm.

With regard to the 3 remaining cases,—

In No. 19.—The kidneys were “large and firm;” the aorta atheromatous throughout; slight general hypertrophy.

In No. 21.—Capsule of kidney slightly adherent; much atheroma of first and second parts of the arch; slight hypertrophy.

In No. 24.—Kidneys congested; first 2 inches of aorta atheromatous; slight hypertrophy.

In each of these cases the hypertrophy is slight, and may probably be accounted for by the condition of the arteries.

Of aneurysms affecting both the ascending and transverse parts of the arch we have 12 cases without hypertrophy, 7 cases with hypertrophy. But with regard to these 7 cases with hypertrophy,—

In No. 11	1 case,
the aortic valves were incompetent.	
In No. 3	1 case,
the aorta is described as highly atheromatous.	
And on referring to the post-mortem records I find	
in Nos. 12, 15	2 cases,
the kidneys were granular.	
And on referring to the clinical notes I find in No. 9	1 case,
there was well-marked aortic regurgitation.	—
	5 cases.

Thus the hypertrophy in 5 cases of the 7 can be satisfactorily explained without the aid of aortic aneurysm.

With regard to the 2 remaining cases,—

In No. 4.—Slight hypertrophy of both ventricles; aorta atheromatous; kidney, two solitary cysts, otherwise natural.

In No. 6.—Slight hypertrophy of left ventricle; aorta atheromatous; kidney natural.

Here, as before, the hypertrophy is slight, and is probably due to the condition of the arteries.

In aneurisms of the descending part of the arch we have 10 cases without hypertrophy, 10 cases with hypertrophy. But with regard to these 10 cases with hypertrophy,—

In Nos. 2, 6, 7 3 cases,
the aorta is described as “highly atheromatous.”

And on referring to the post-mortem records I find in
Nos. 8, 11, 15, 16, 17, 20 6 cases,
the kidneys were granular. —
9 cases.

Thus the hypertrophy in 9 cases out of the 10 can be satisfactorily explained without the aid of aortic aneurism.

With regard to the remaining case,—

No. 9.—Heart weighed 13 oz.; some atheroma of arch; kidney natural.

Finally, then, taking all the cases together, we have 124 cases of aneurism of the arch of the aorta:

In 68 of them there was no hypertrophy of the left ventricle.

In 47 of them the hypertrophy could be perfectly explained by other causes present.

In 9 of them the hypertrophy could very probably be explained by other causes present.

Therefore, so far as the records of St. Bartholomew's Hospital are concerned, there is no evidence in favour of aortic aneurism being a cause of hypertrophy of the left ventricle.

(For report of the discussion on this paper, see ‘Proceedings of the Royal Medical and Chirurgical Society,’ Third Series, vol. xi, p. 37.)