In [1]:
```
# import pandas library
import pandas as pd
from sklearn.model_selection import train_test_split
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder
```

In [2]:
```
# Reading csv file
data = pd.read_csv("Heart.csv")
# creating a dataframe of it
data = pd.DataFrame(data)
data.head()
```

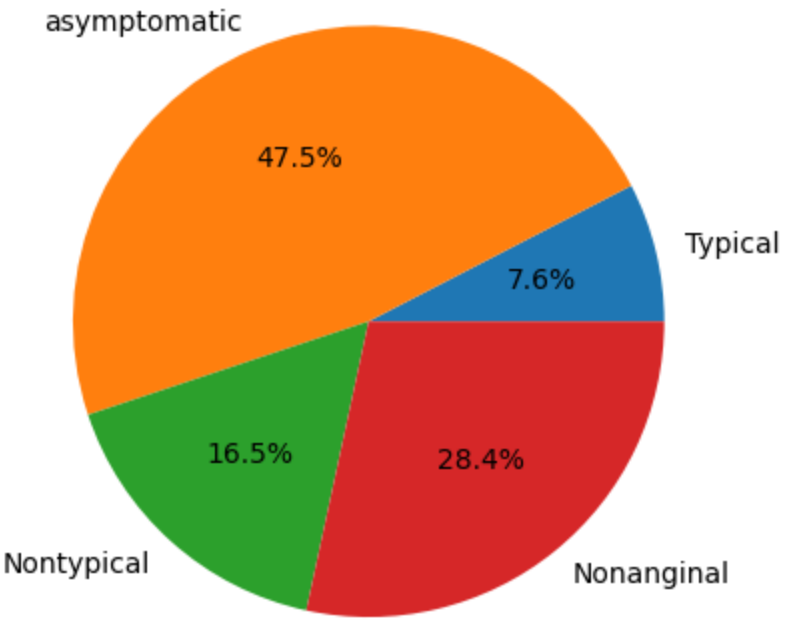
Out[2]:

	Unnamed: 0	Age	Sex	ChestPain	RestBP	Chol	Fbs	RestECG	MaxHR	ExAng	Oldpeak	Slope	Ca
0	1	63	1	typical	145	233	1	2	150	0	2.3	3	0.0
1	2	67	1	asymptomatic	160	286	0	2	108	1	1.5	2	3.0
2	3	67	1	asymptomatic	120	229	0	2	129	1	2.6	2	2.0
3	4	37	1	nonanginal	130	250	0	0	187	0	3.5	3	0.0
4	5	41	0	nontypical	130	204	0	2	172	0	1.4	1	0.0

In [3]:
```
val = data['ChestPain'].value_counts()
print(val)
labels = ['Typical', 'asymptomatic', 'Nontypical', 'Nonanginal']
x = [23, 144, 50, 86]
plt.pie(x, labels=labels, autopct='%1.1f%%')
```

```
asymptomatic    144
nonanginal       86
nontypical       50
typical          23
Name: ChestPain, dtype: int64
```

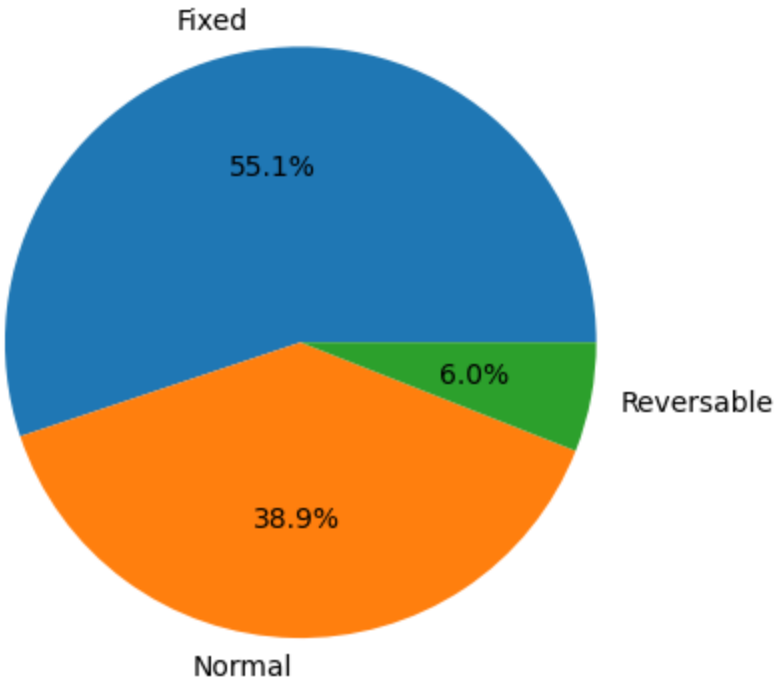
Out[3]:
```
([<matplotlib.patches.Wedge at 0x20ccbbf34f0>,
  <matplotlib.patches.Wedge at 0x20ccbbf3a60>,
  <matplotlib.patches.Wedge at 0x20ccbc3c130>,
  <matplotlib.patches.Wedge at 0x20ccbc3c7c0>],
 [Text(1.0688703878101182, 0.25983859232732825, 'Typical'),
  Text(-0.4275284961750052, 1.0135183199914735, 'asymptomatic'),
  Text(-0.7343469291842987, -0.8189838750534658, 'Nontypical'),
  Text(0.6909220905824778, -0.8559361335667157, 'Nonanginal')],
 [Text(0.5830202115327917, 0.14173014126945177, '7.6%'),
  Text(-0.2331973615500028, 0.5528281745408037, '47.5%'),
  Text(-0.4005528704641629, -0.4467184773018904, '16.5%'),
  Text(0.3768665948631697, -0.46687425467275395, '28.4%')])
```



In [4]:
```
val = data['Thal'].value_counts()
print(val)
labels = ['Fixed', 'Normal', 'Reversable']
x = [166, 117, 18]
plt.pie(x, labels=labels, autopct='%1.1f%%')
```

```
normal        166
reversable    117
fixed          18
Name: Thal, dtype: int64
```

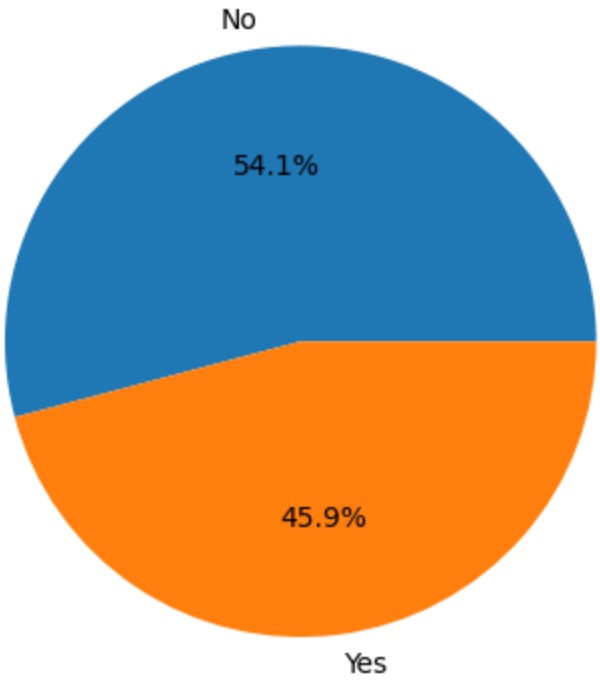
Out[4]:
```
([<matplotlib.patches.Wedge at 0x20ccde48040>,
  <matplotlib.patches.Wedge at 0x20ccde48670>,
  <matplotlib.patches.Wedge at 0x20ccde48d00>],
 [Text(-0.17717879093667105, 1.0856369909146517, 'Fixed'),
  Text(-0.02869897117848817, -1.0996255585667771, 'Normal'),
  Text(1.0806448558683255, -0.2054426817516895, 'Reversable')],
 [Text(-0.09664297687454783, 0.5921656314079917, '55.1%'),
  Text(-0.015653984279175363, -0.599795759218242, '38.9%'),
  Text(0.5894426486554503, -0.11205964459183064, '6.0%')])
```



In [5]:
```
val = data['AHD'].value_counts()
print(val)
labels = ['No', 'Yes']
x = [164, 139]
plt.pie(x, labels=labels, autopct='%1.1f%%')
```

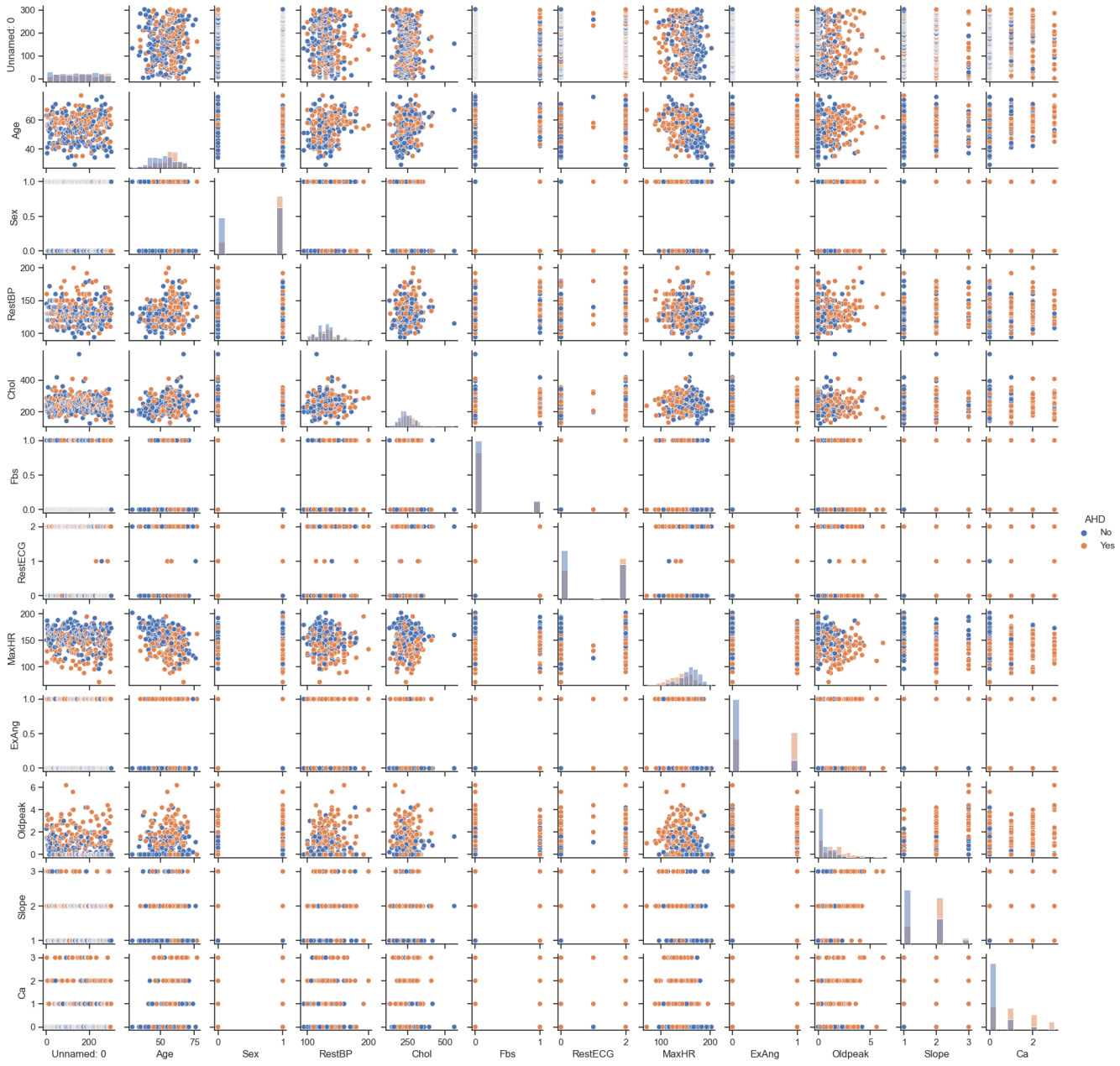
```
No     164
Yes    139
Name: AHD, dtype: int64
```

Out[5]:
```
([<matplotlib.patches.Wedge at 0x20ccde7f790>,
  <matplotlib.patches.Wedge at 0x20ccde7fe20>],
 [Text(-0.14216517139859375, 1.0907745248405871, 'No'),
  Text(0.1421650692729111, -1.0907745381510465, 'Yes')],
 [Text(-0.07754463894468748, 0.5949679226403202, '54.1%'),
  Text(0.07754458323976968, -0.5949679299005707, '45.9%')])
```



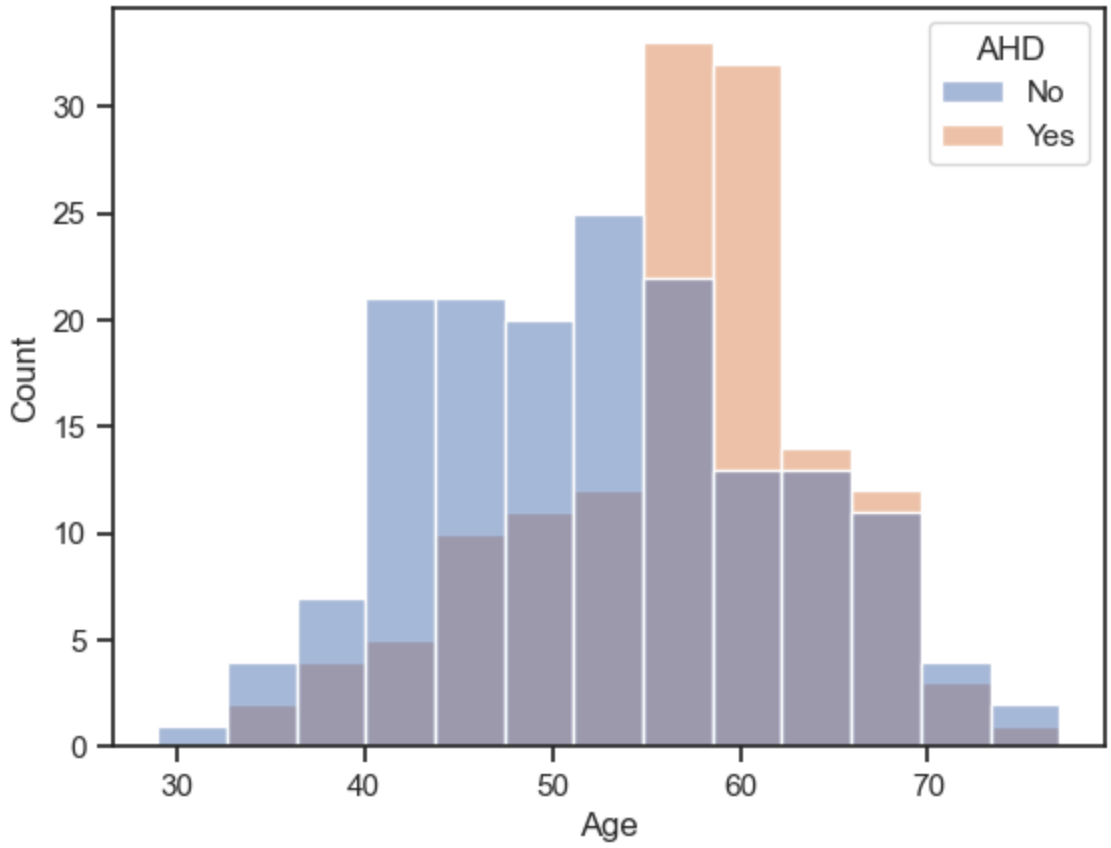
In [6]:
```
sns.set_theme(style="ticks")
sns.pairplot(data, hue="AHD", diag_kind="hist", height=1.5)
```

Out[6]:
```
<seaborn.axisgrid.PairGrid at 0x20ccde4aad0>
```



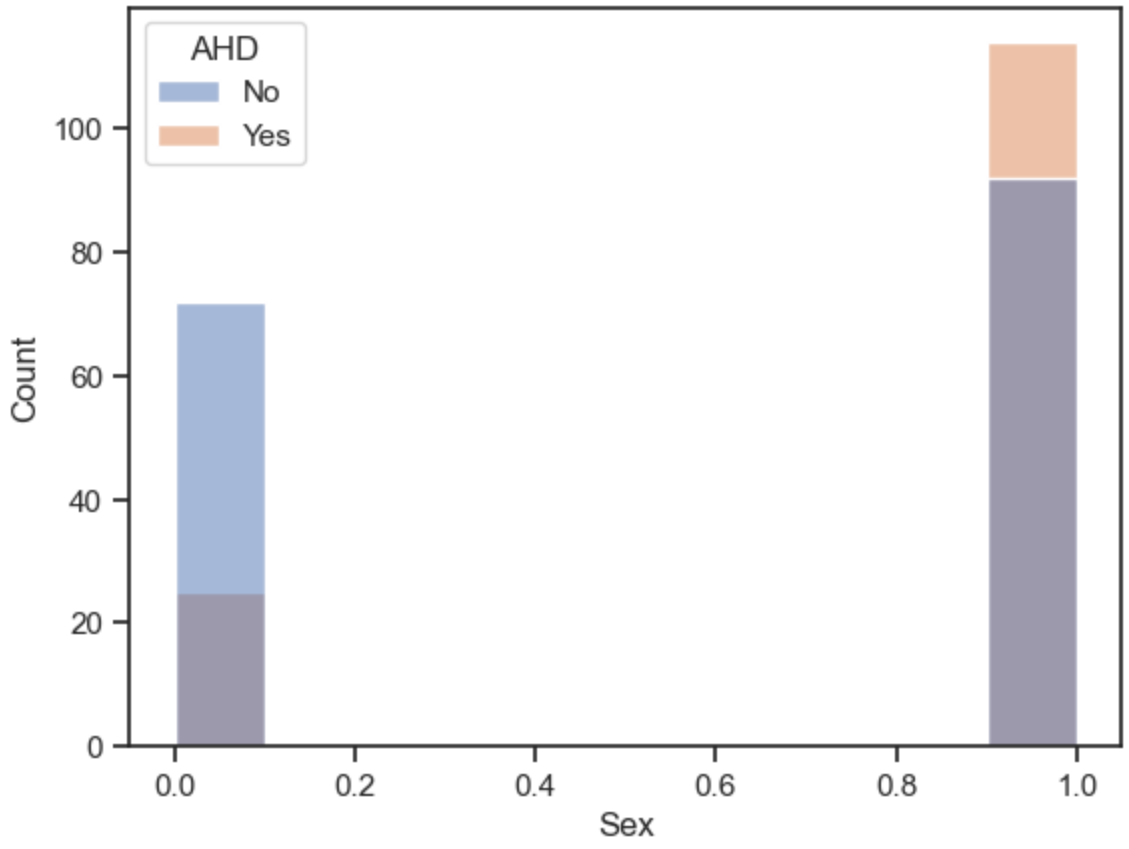
In [7]:
```
sns.histplot(data=data,x=data['Age'], hue='AHD')
```

Out[7]: <AxesSubplot: xlabel='Age', ylabel='Count'>



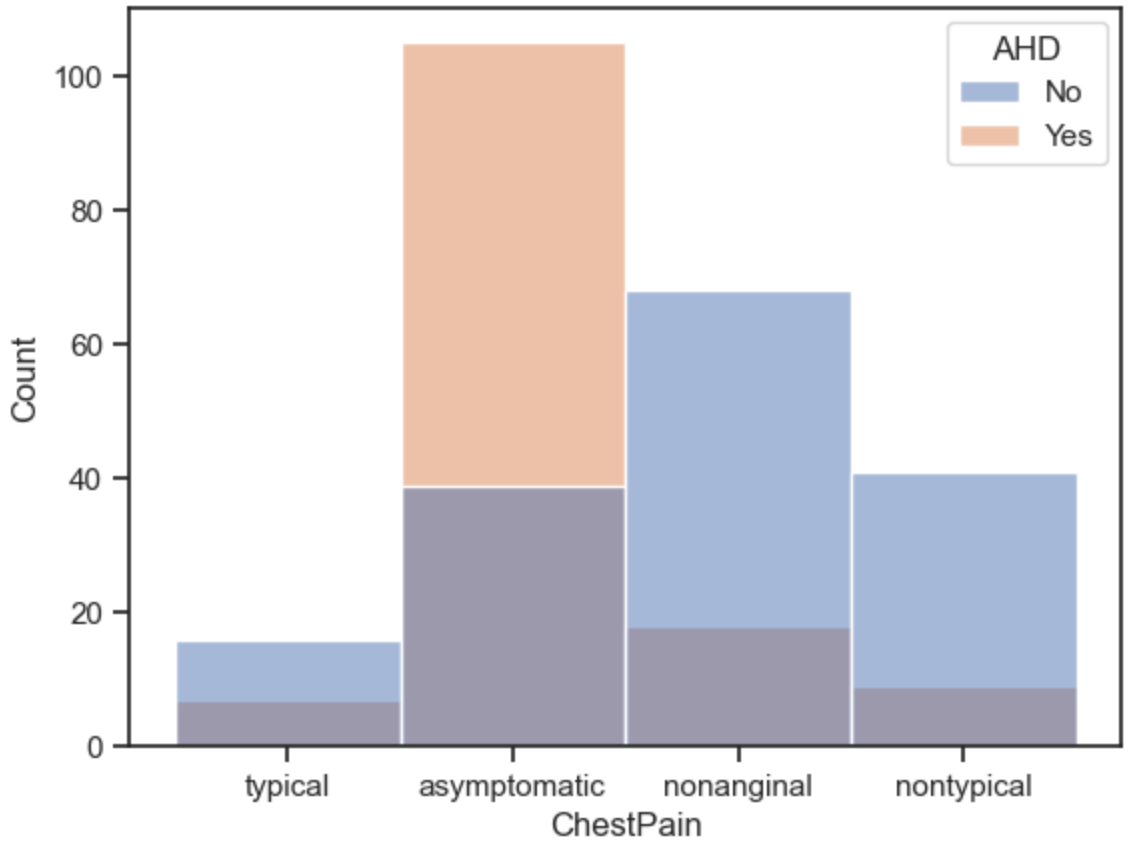
In [8]:
```
sns.histplot(data=data,x=data['Sex'], hue='AHD')
```

Out[8]: <AxesSubplot: xlabel='Sex', ylabel='Count'>



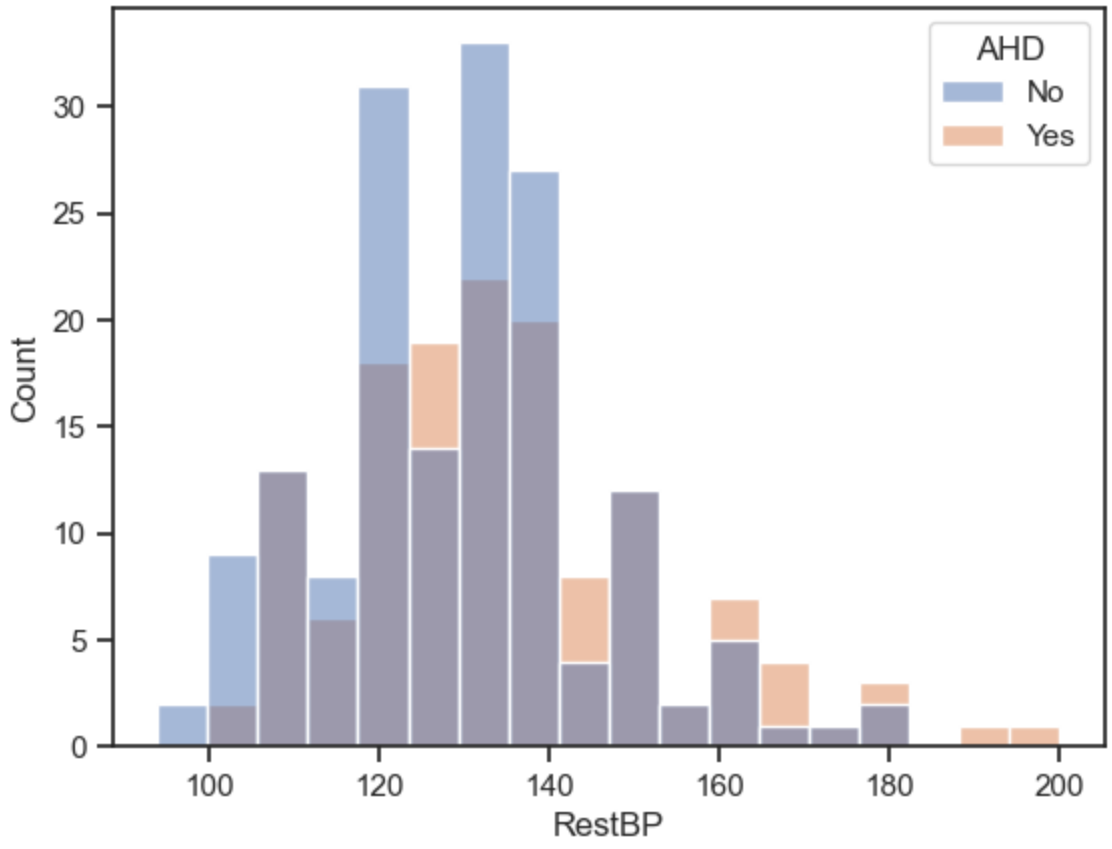
In [9]:
```
sns.histplot(data=data,x=data['ChestPain'], hue='AHD')
```

Out[9]: <AxesSubplot: xlabel='ChestPain', ylabel='Count'>



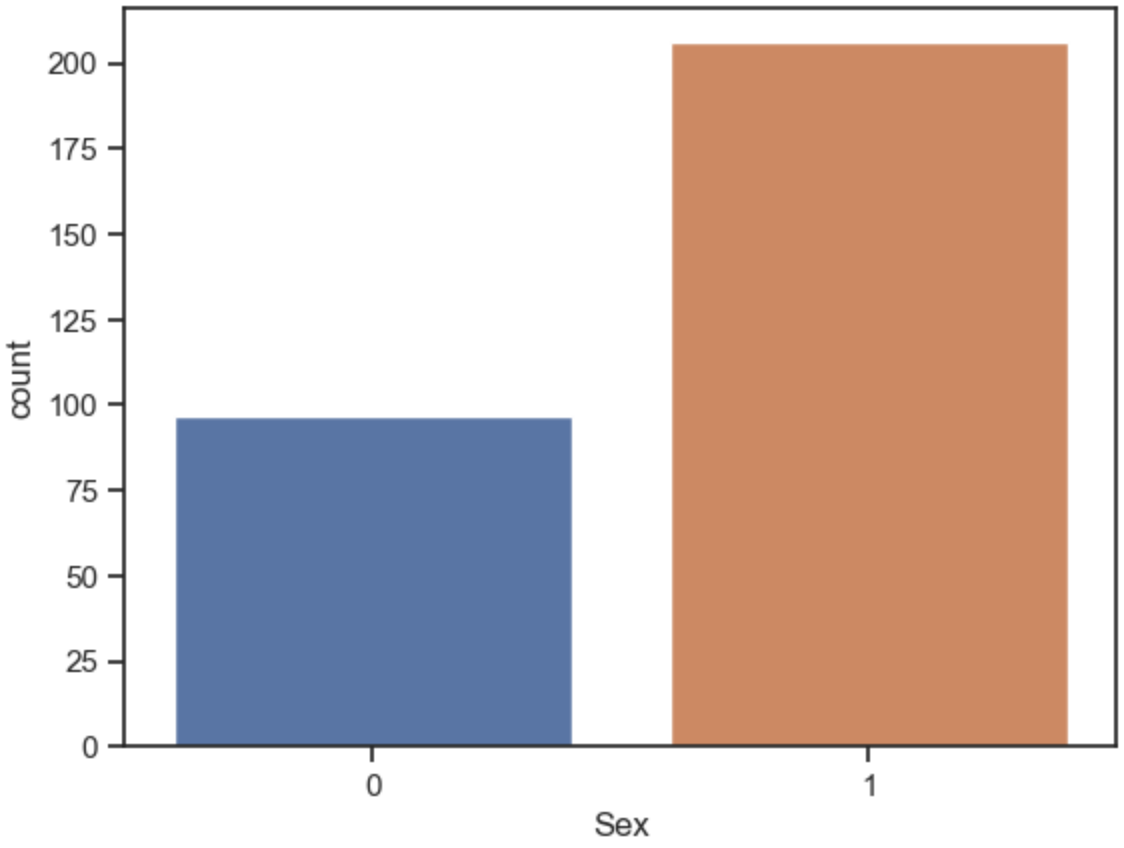
In [10]:
```
sns.histplot(data=data,x=data['RestBP'], hue='AHD')
```

Out[10]: <AxesSubplot: xlabel='RestBP', ylabel='Count'>



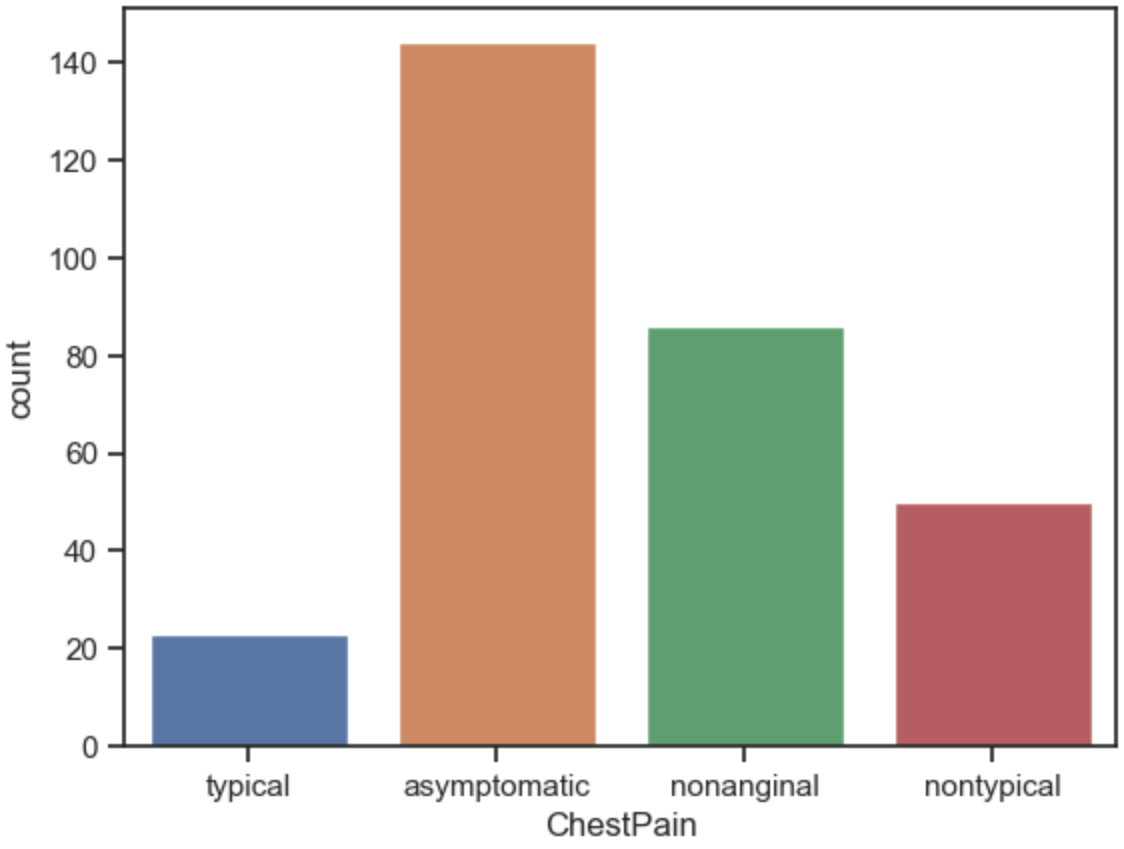
In [11]:
```
sns.countplot(data=data, x=data['Sex'])
```

Out[11]: <AxesSubplot: xlabel='Sex', ylabel='count'>



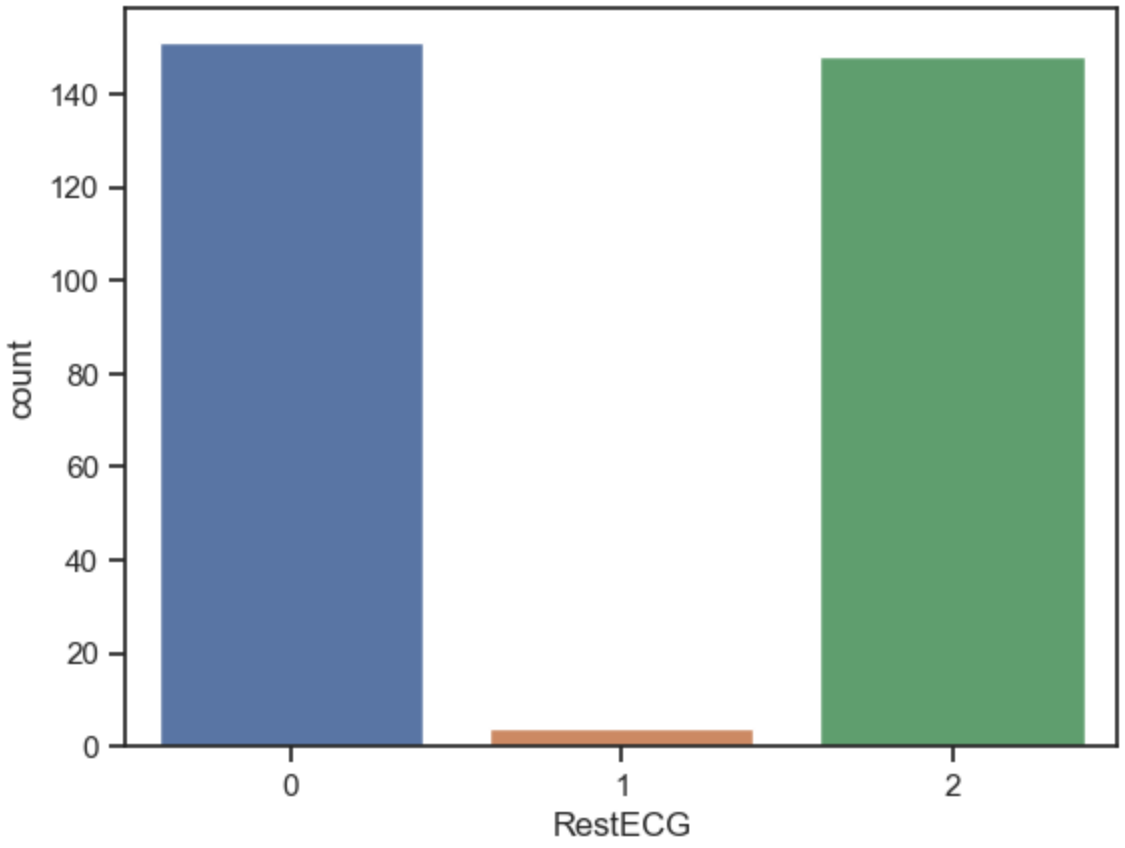
In [12]:
```
sns.countplot(data=data, x=data['ChestPain'])
```

Out[12]: <AxesSubplot: xlabel='ChestPain', ylabel='count'>



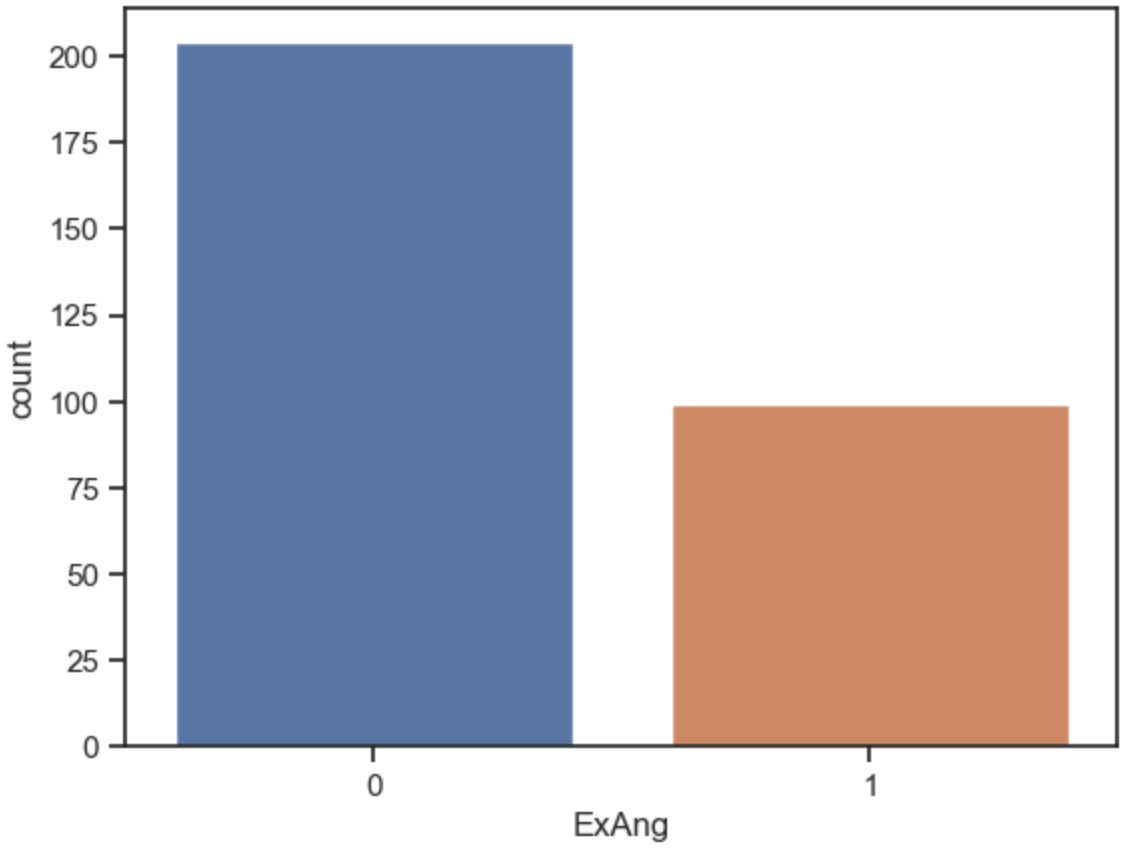
In [13]:
```
sns.countplot(data=data, x=data['RestECG'])
```

Out[13]: <AxesSubplot: xlabel='RestECG', ylabel='count'>



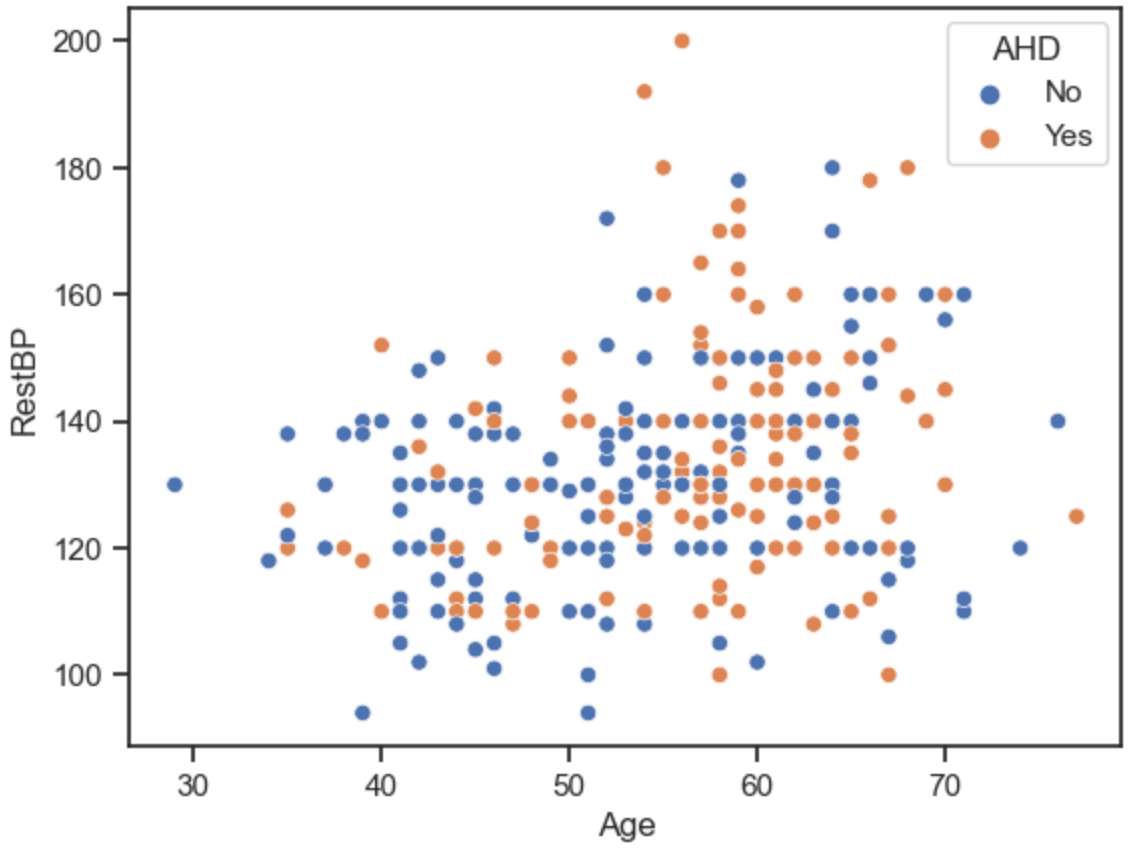
In [14]:
```
sns.countplot(data=data, x=data['ExAng'])
```

Out[14]: <AxesSubplot: xlabel='ExAng', ylabel='count'>



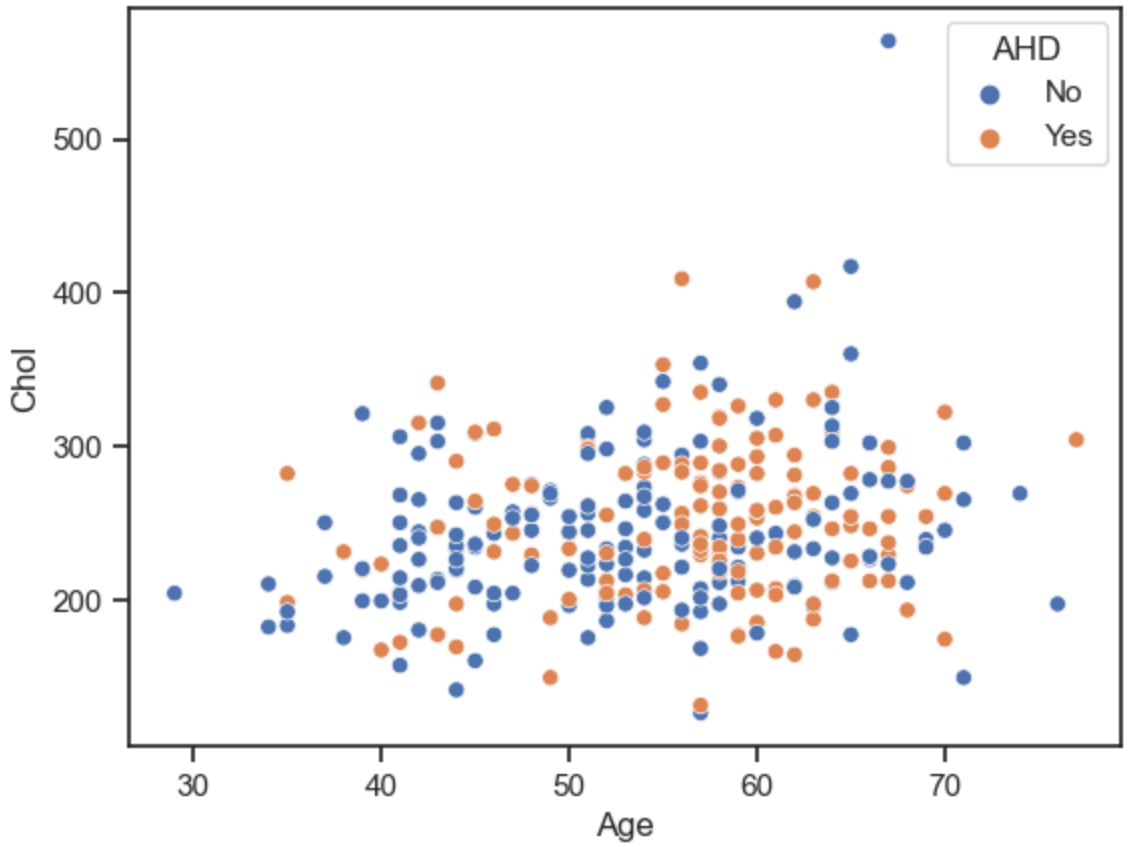
In [15]:
```
sns.scatterplot(data=data, x="Age", y="RestBP", hue="AHD")
```

Out[15]: <AxesSubplot: xlabel='Age', ylabel='RestBP'>



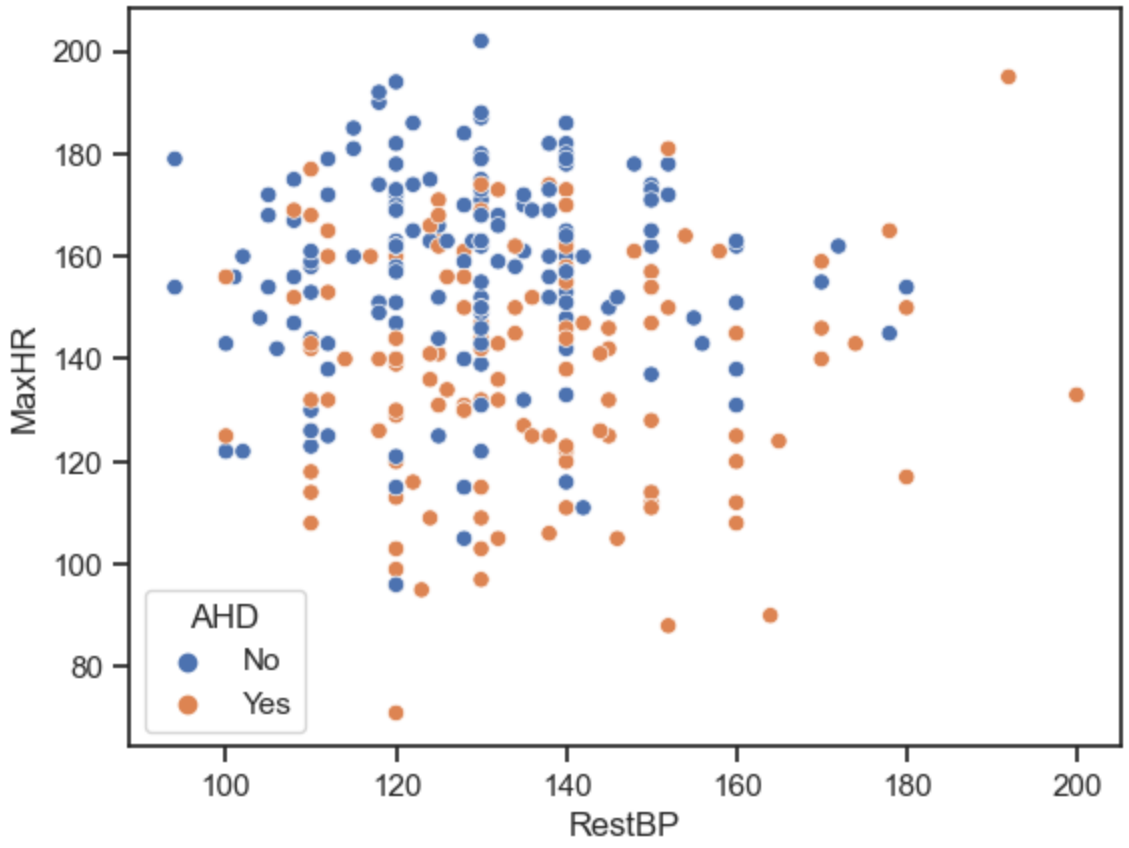
In [16]:
```
sns.scatterplot(data=data, x="Age", y="Chol", hue="AHD")
```

Out[16]: <AxesSubplot: xlabel='Age', ylabel='Chol'>



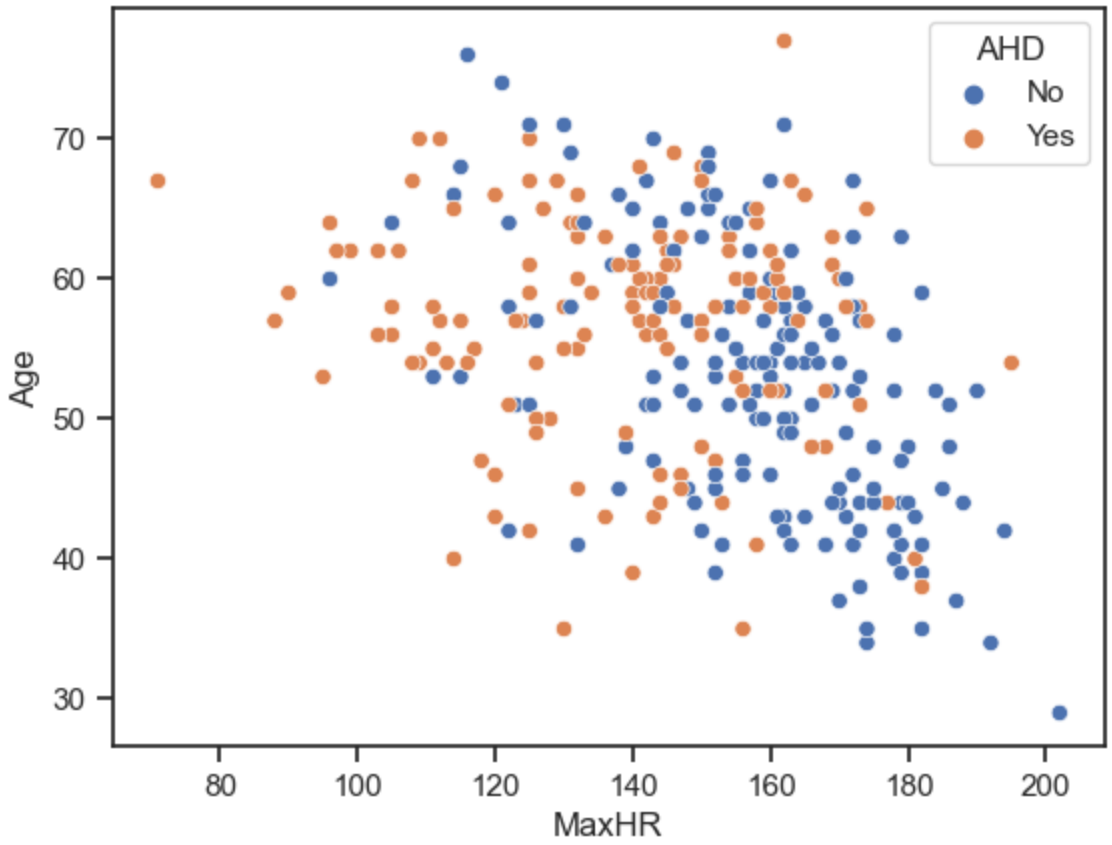
In [17]:
```
sns.scatterplot(data=data, x="RestBP", y="MaxHR", hue="AHD")
```

Out[17]:
```
<AxesSubplot: xlabel='RestBP', ylabel='MaxHR'>
```



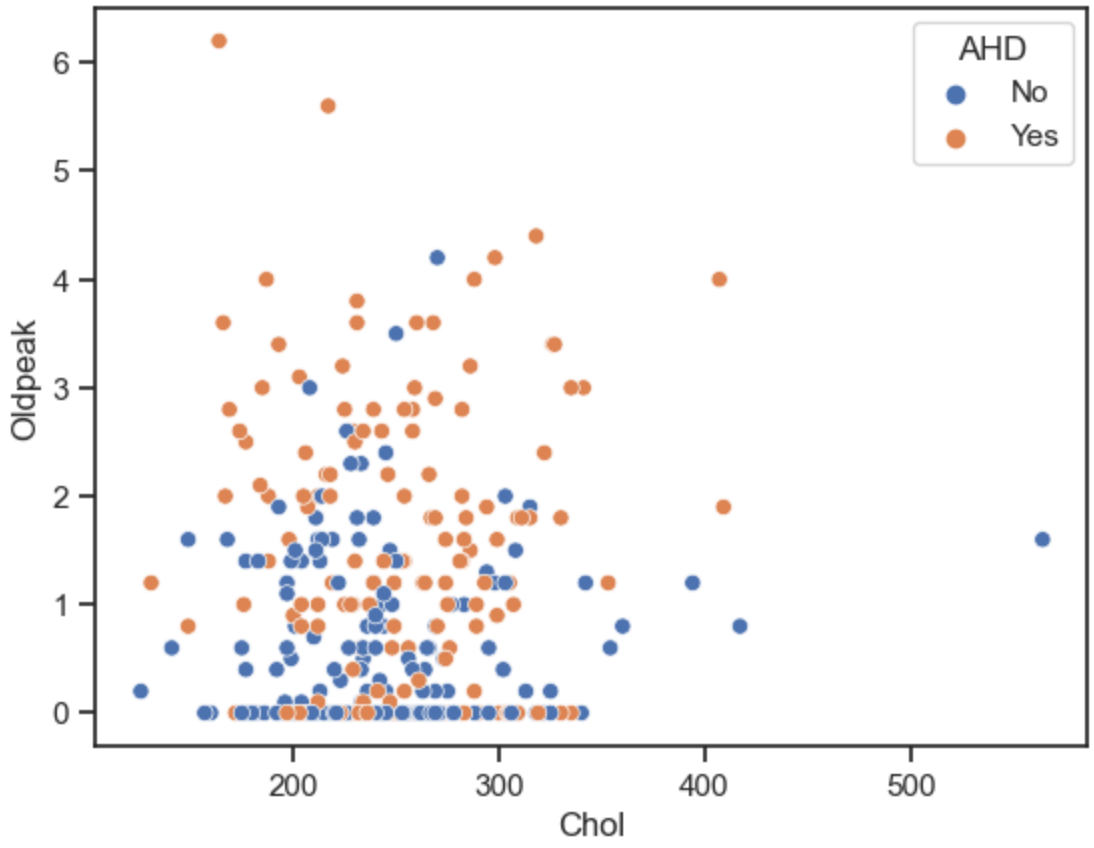
In [18]:
```
sns.scatterplot(data=data, x="MaxHR", y="Age", hue="AHD")
```

Out[18]:
```
<AxesSubplot: xlabel='MaxHR', ylabel='Age'>
```



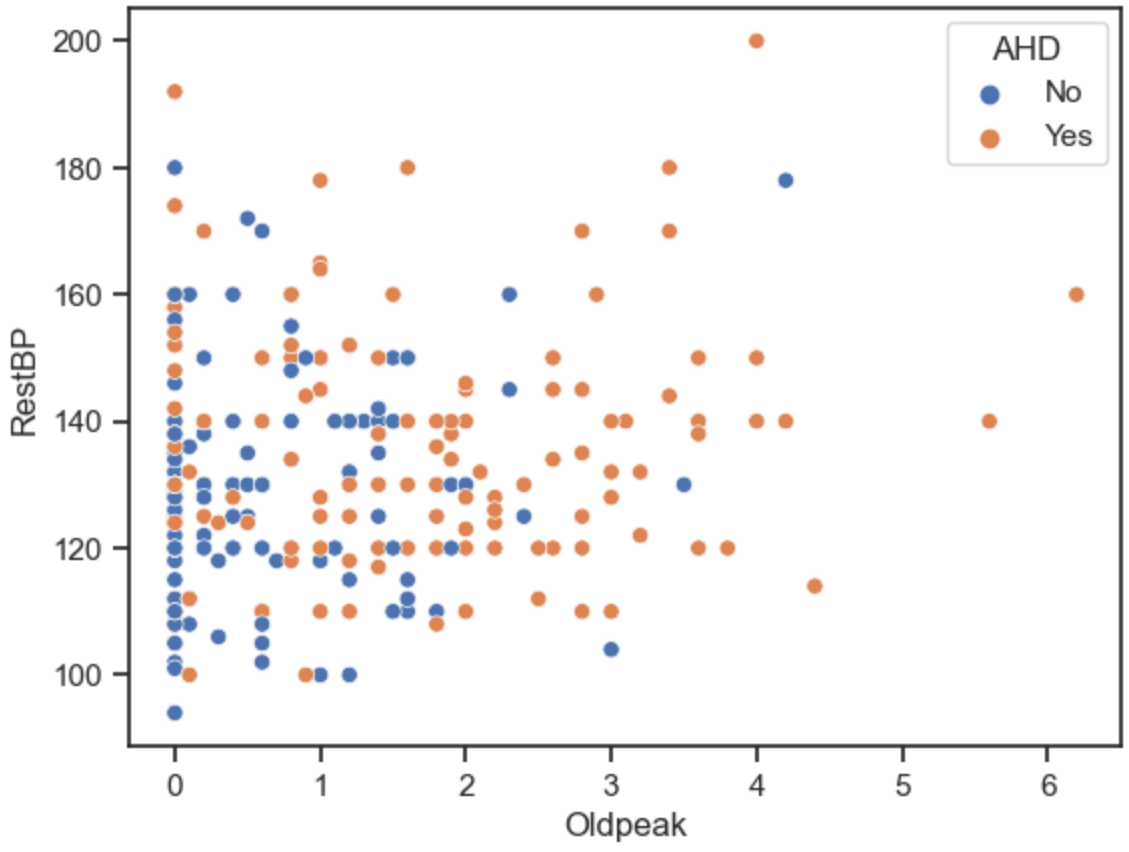
In [19]:
```
sns.scatterplot(data=data, x="Chol", y="Oldpeak", hue="AHD")
```

Out[19]:
```
<AxesSubplot: xlabel='Chol', ylabel='Oldpeak'>
```



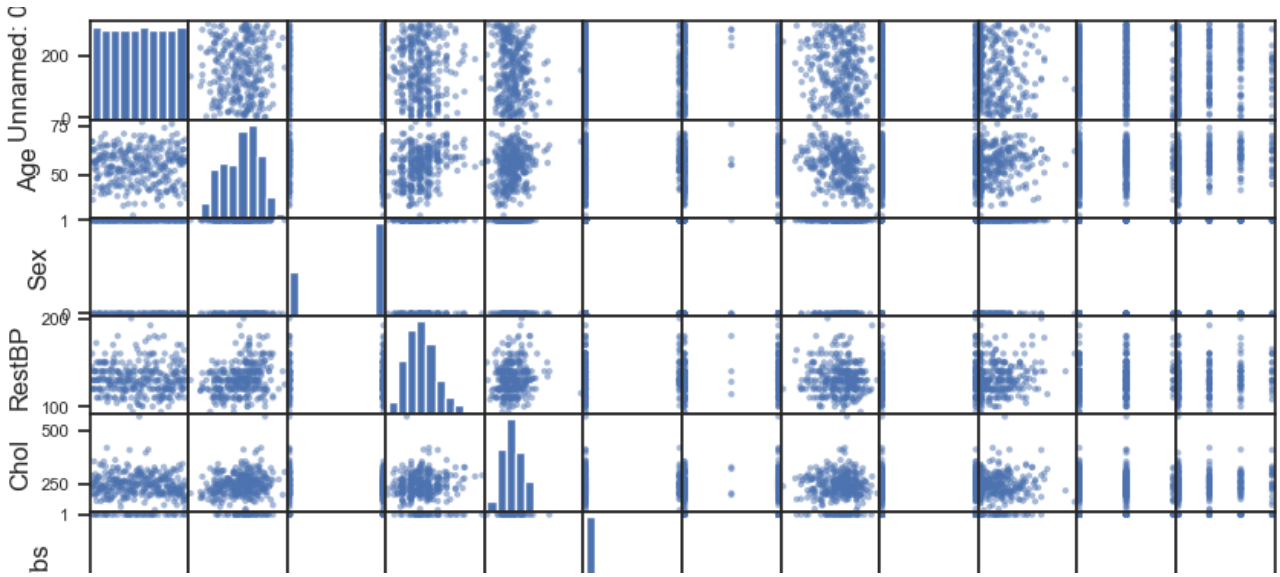
In [20]:
```
sns.scatterplot(data=data, x="Oldpeak", y="RestBP", hue="AHD")
```

Out[20]:
```
<AxesSubplot: xlabel='Oldpeak', ylabel='RestBP'>
```



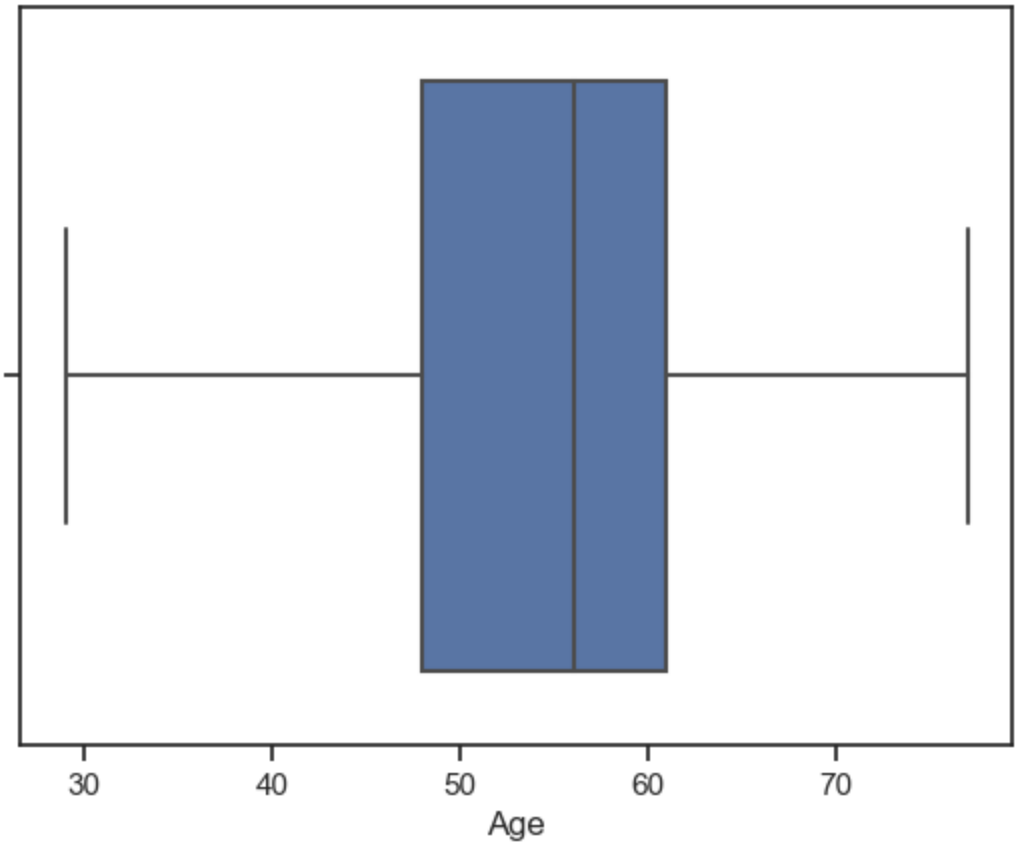
In [32]:
```
pd.plotting.scatter_matrix(data, figsize=(10, 10))
```

```
<AxesSubplot: xlabel='Slope', ylabel='Ca'>,
<AxesSubplot: xlabel='Ca', ylabel='Ca'>]], dtype=object)
```



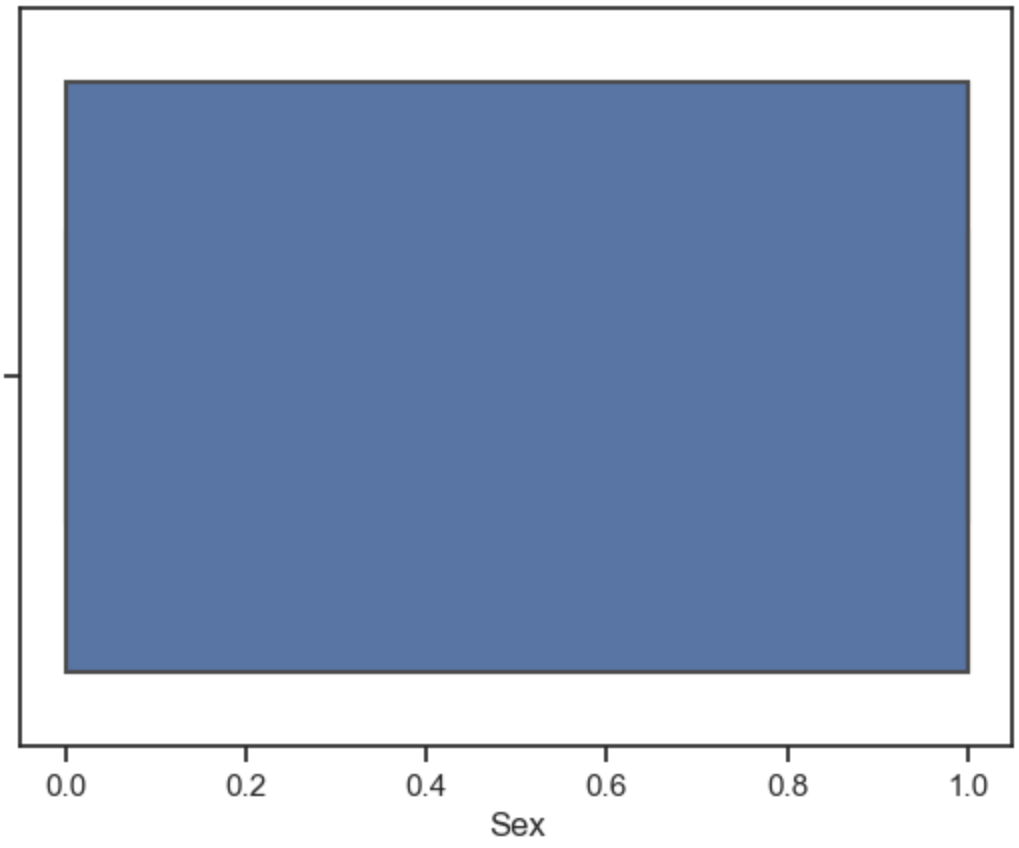
In [22]:
```
sns.boxplot(x=data["Age"])
```

Out[22]:
```
<AxesSubplot: xlabel='Age'>
```



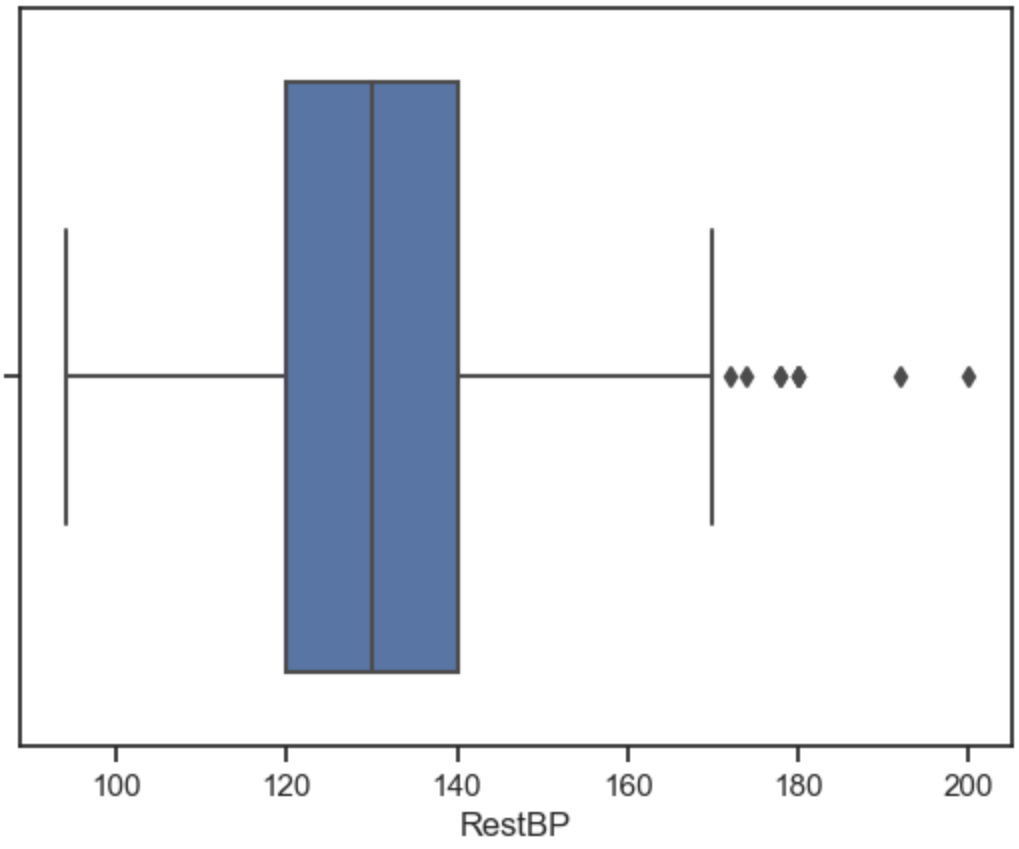
In [23]:
```
sns.boxplot(x=data["Sex"])
```

Out[23]: <AxesSubplot: xlabel='Sex'>



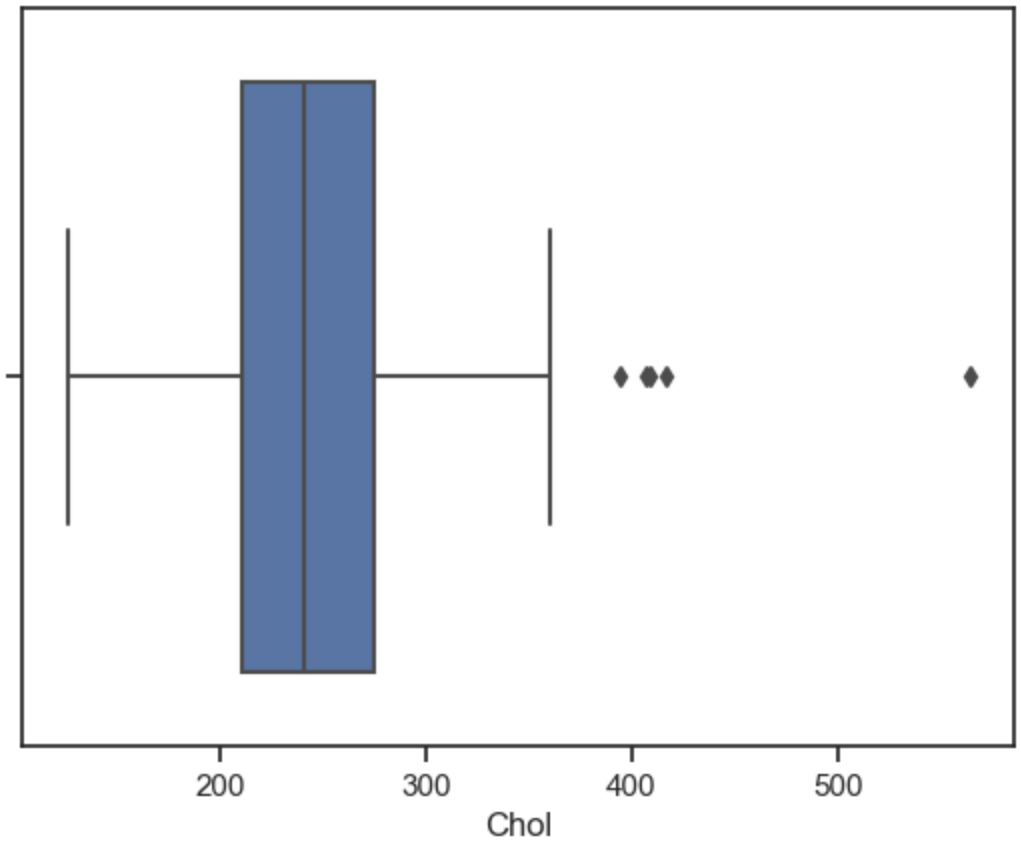
In [24]:
```
sns.boxplot(x=data["RestBP"])
```

Out[24]: <AxesSubplot: xlabel='RestBP'>



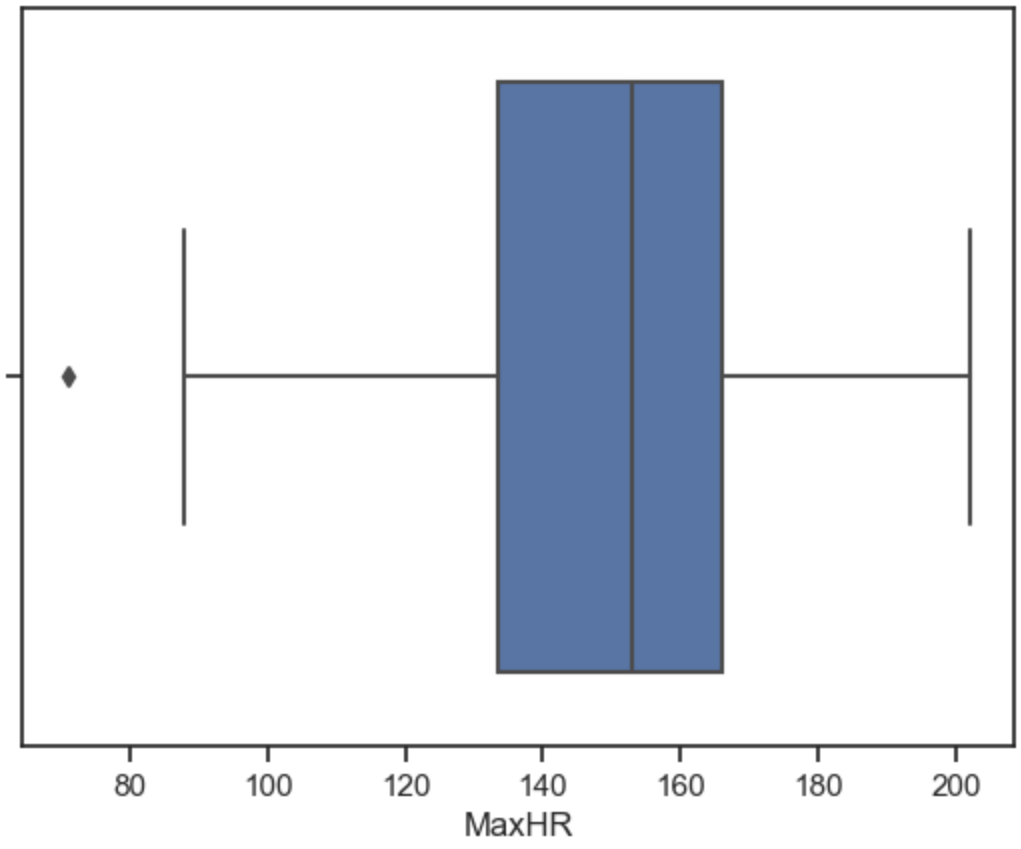
In [25]:
```
sns.boxplot(x=data["Chol"])
```

Out[25]: <AxesSubplot: xlabel='Chol'>



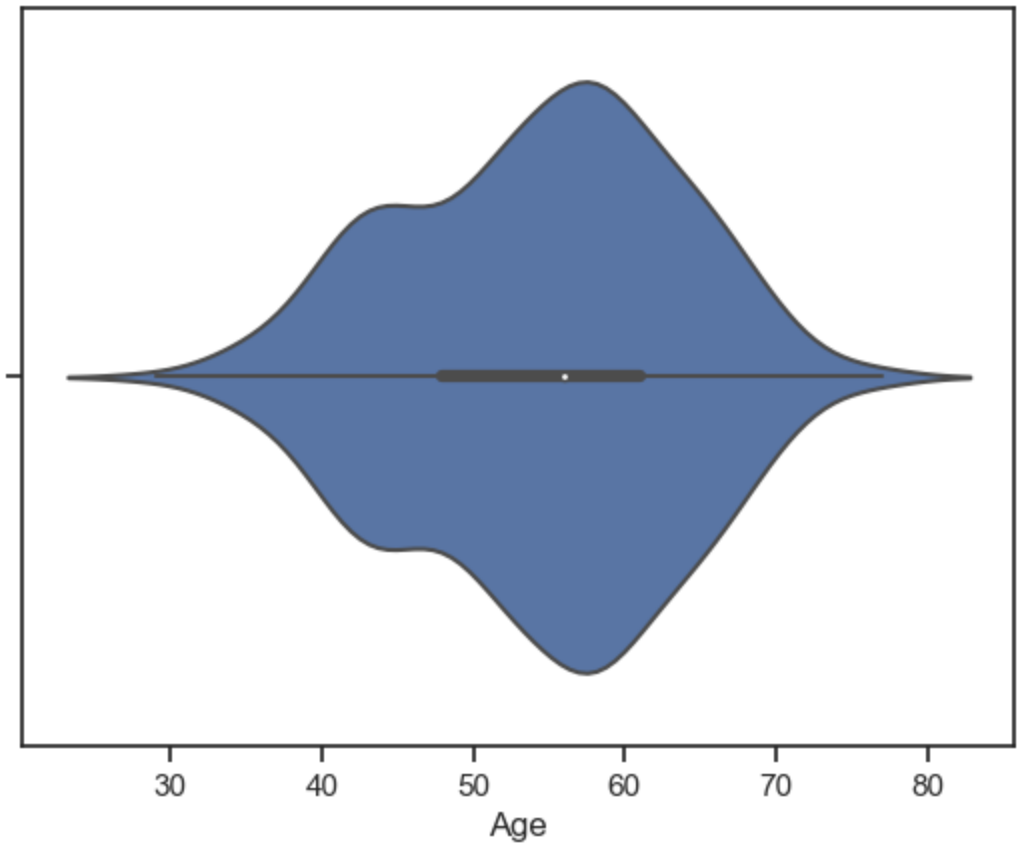
In [26]:
```
sns.boxplot(x=data["MaxHR"])
```

Out[26]: <AxesSubplot: xlabel='MaxHR'>



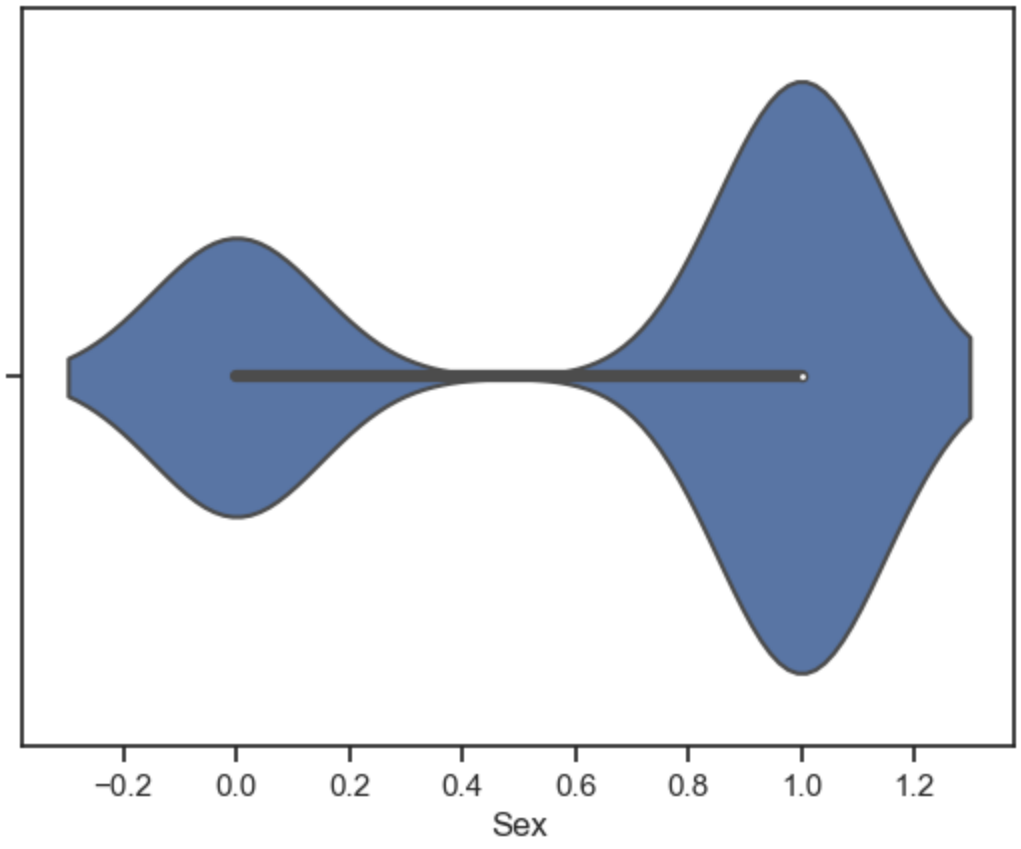
In [27]:
```
sns.violinplot(x=data["Age"])
```

Out[27]: <AxesSubplot: xlabel='Age'>



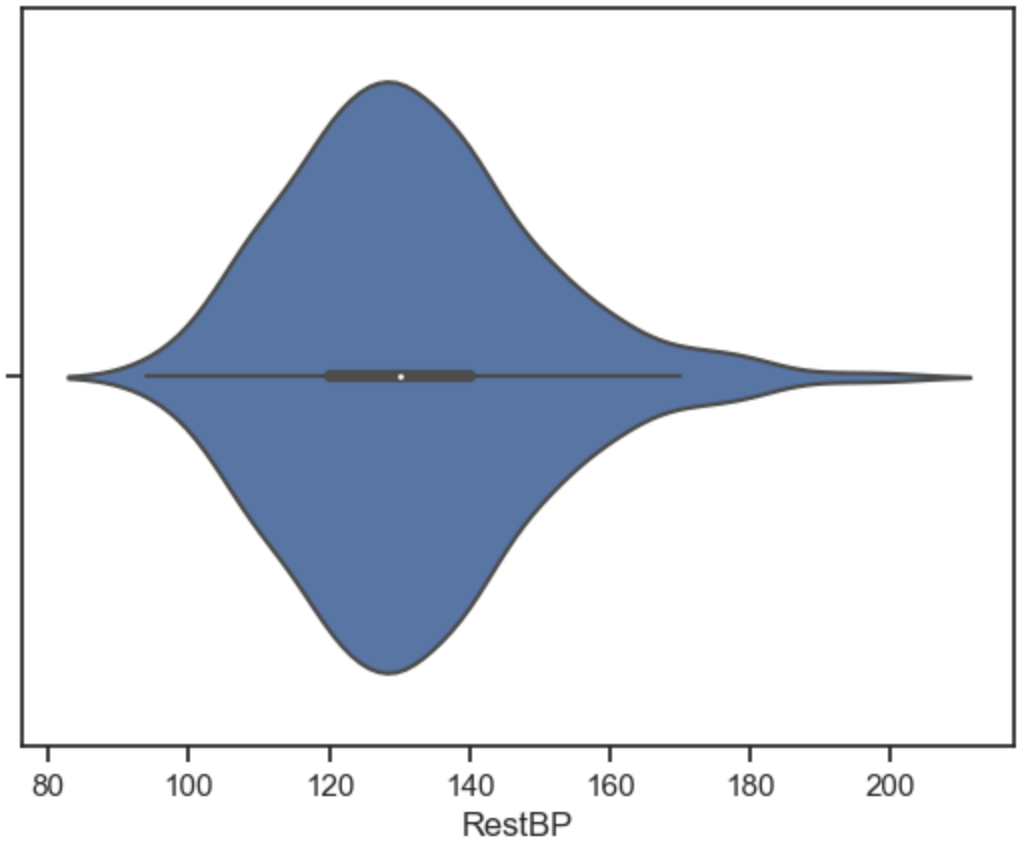
In [28]:
```
sns.violinplot(x=data["Sex"])
```

Out[28]: <AxesSubplot: xlabel='Sex'>



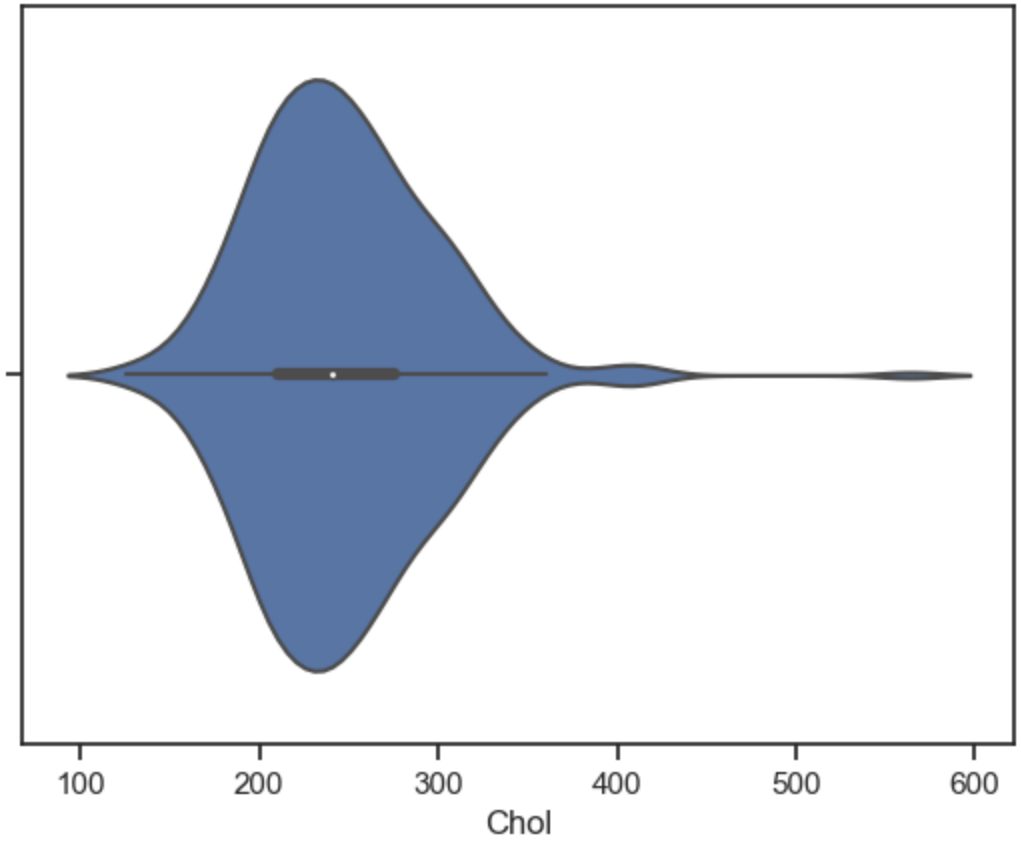
In [29]:
```
sns.violinplot(x=data["RestBP"])
```

Out[29]: <AxesSubplot: xlabel='RestBP'>



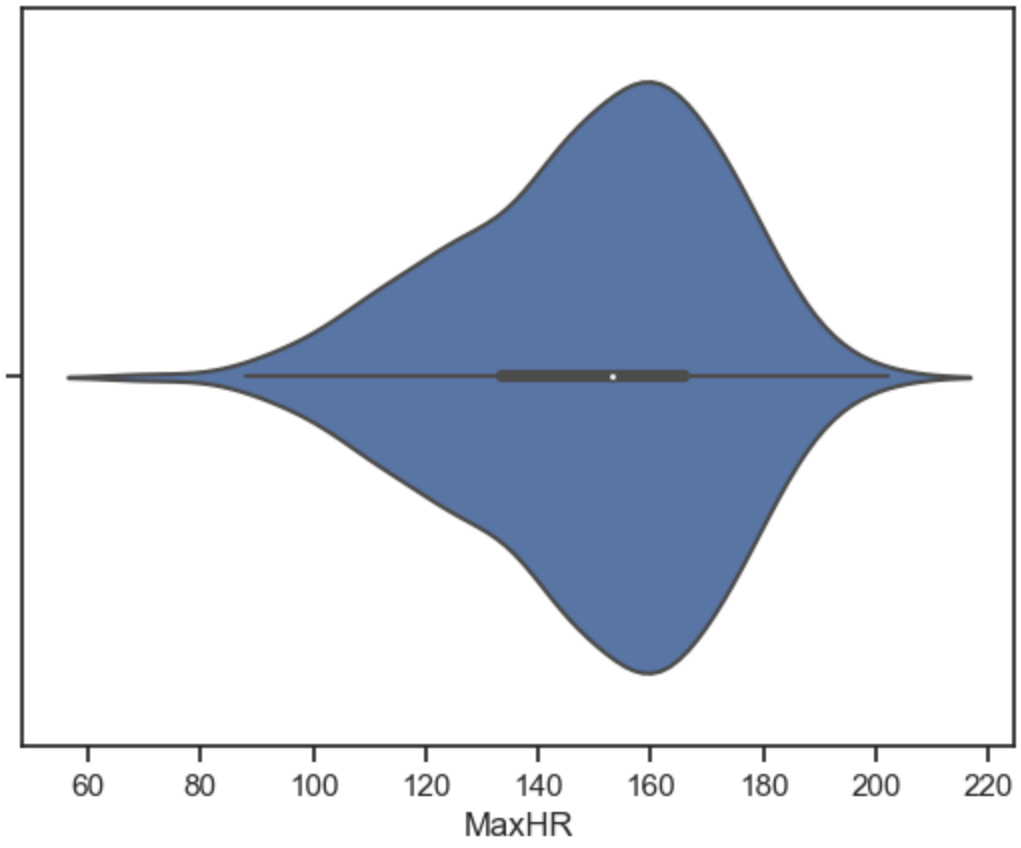
In [30]:
```
sns.violinplot(x=data["Chol"])
```

Out[30]: <AxesSubplot: xlabel='Chol'>



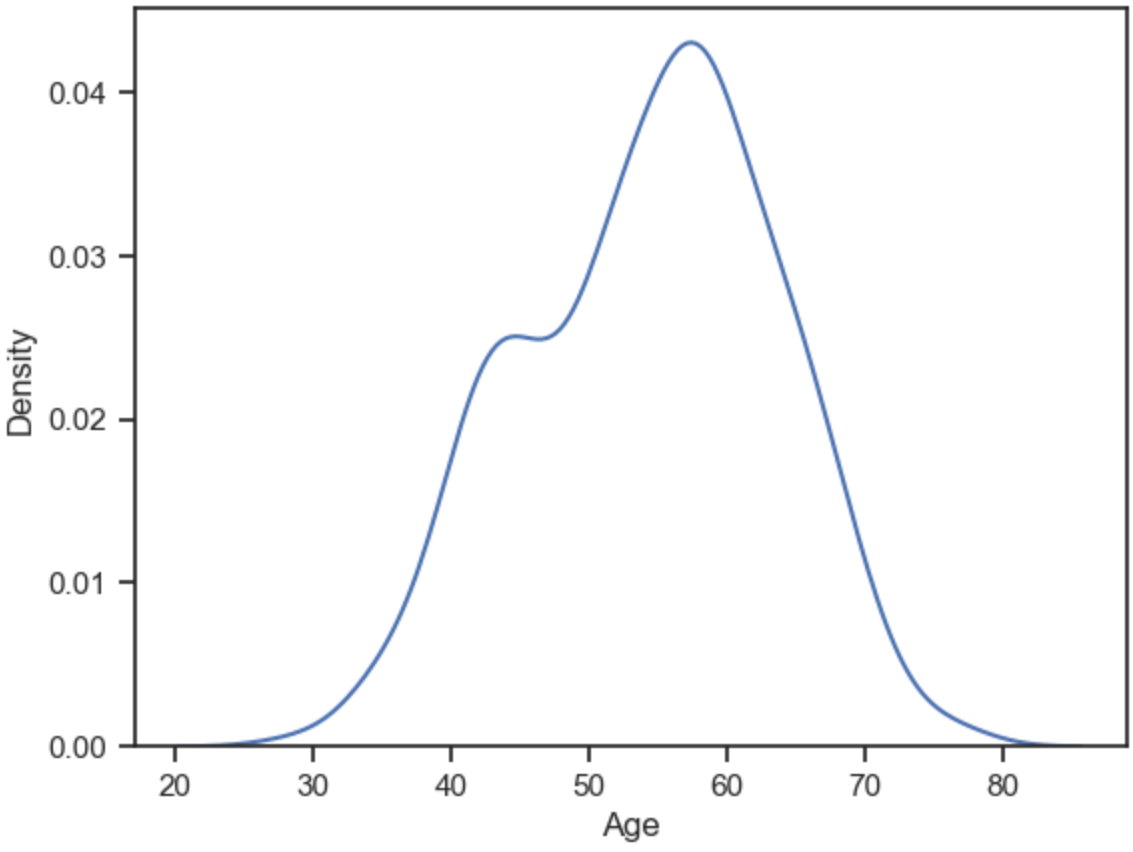
In [31]:
```
sns.violinplot(x=data["MaxHR"])
```

Out[31]: <AxesSubplot: xlabel='MaxHR'>



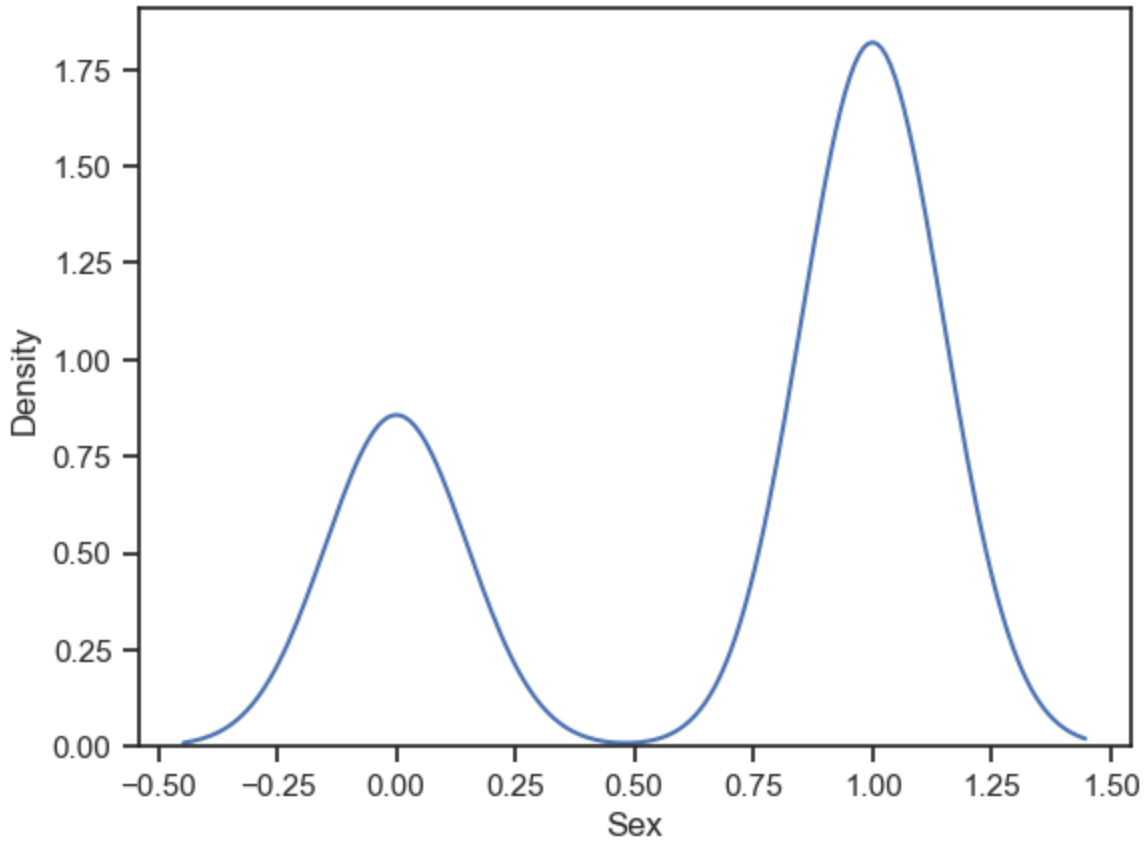
In [33]:
```
sns.kdeplot(data=data, x=data['Age'])
```

Out[33]: <AxesSubplot: xlabel='Age', ylabel='Density'>



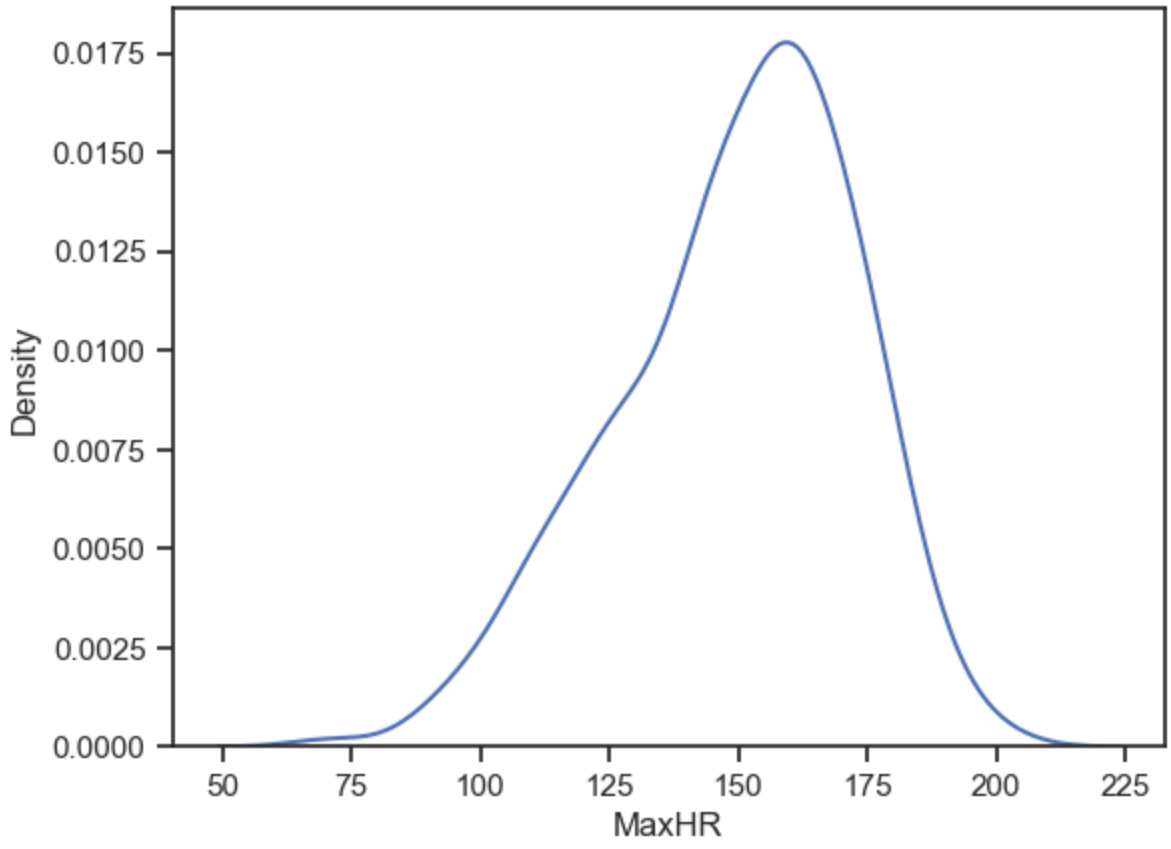
In [34]:
```
sns.kdeplot(data=data, x=data['Sex'])
```

Out[34]: <AxesSubplot: xlabel='Sex', ylabel='Density'>



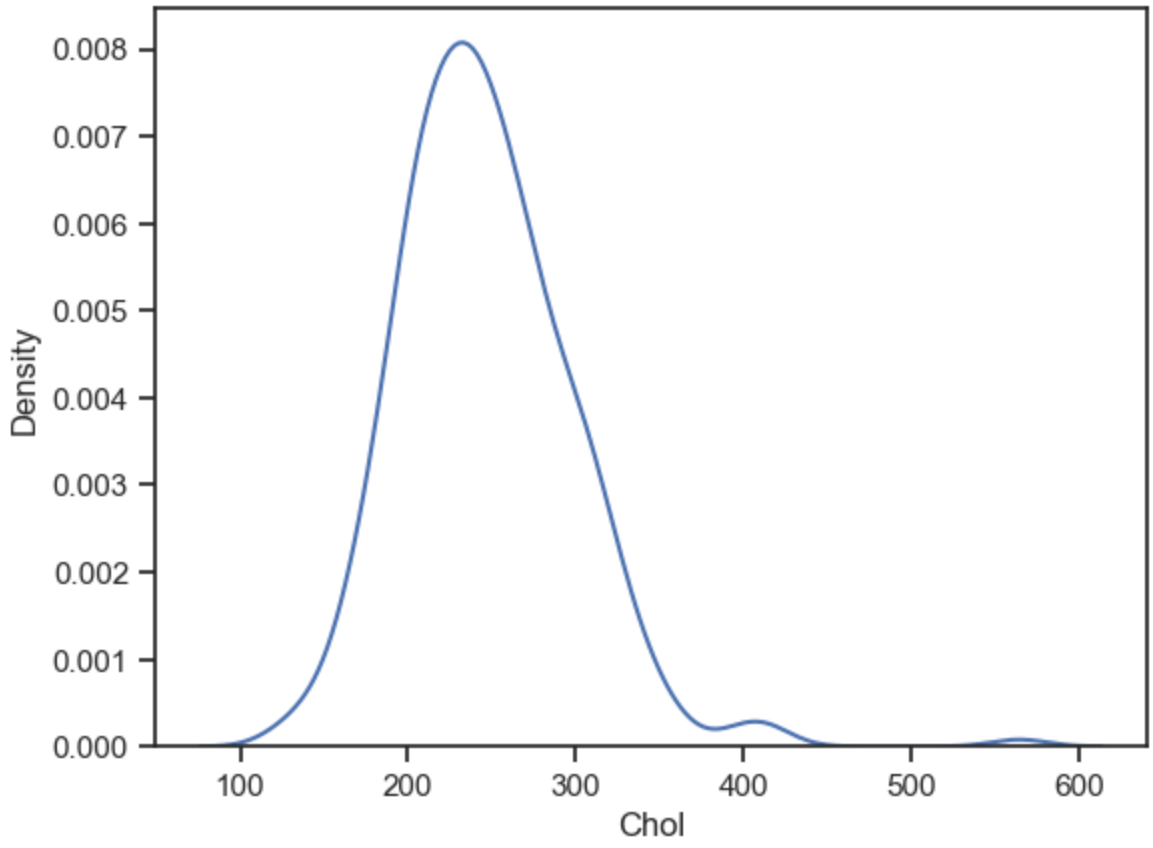
In [35]:
```
sns.kdeplot(data=data, x=data['MaxHR'])
```

Out[35]: <AxesSubplot: xlabel='MaxHR', ylabel='Density'>



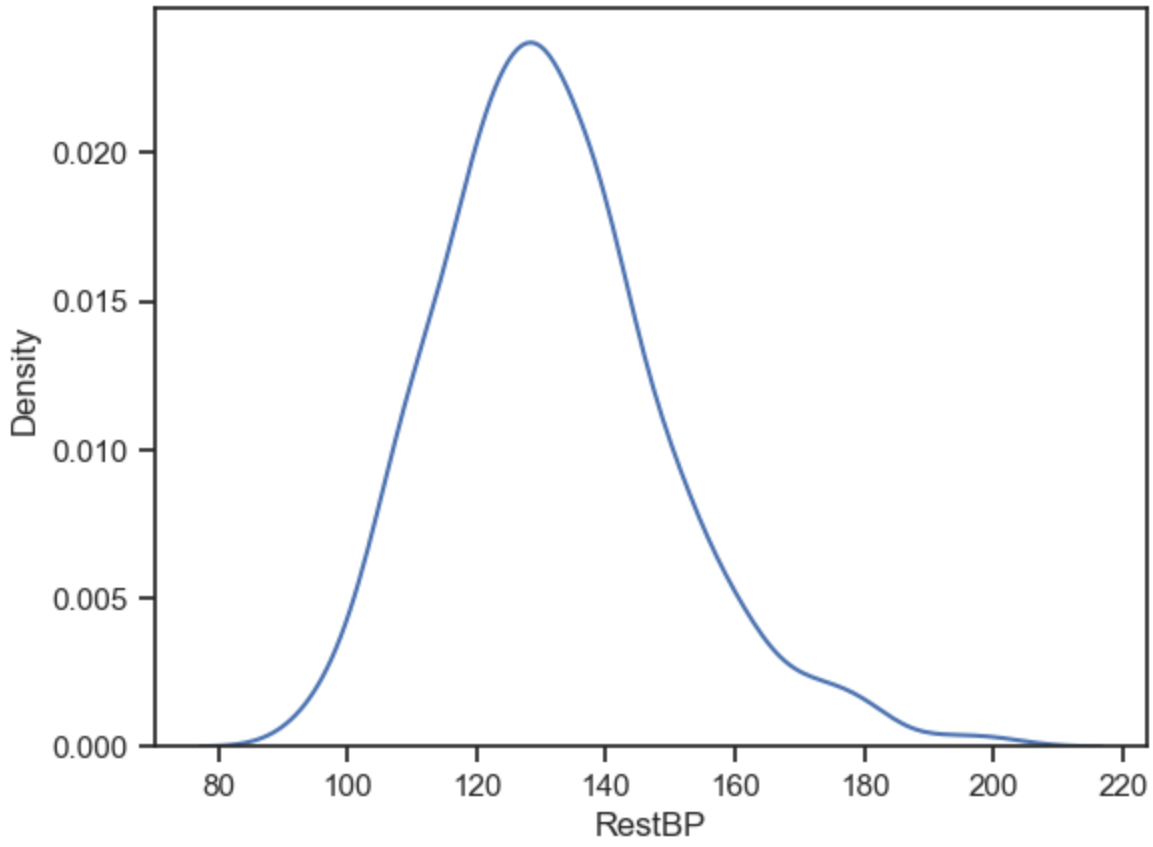
In [36]:
```
sns.kdeplot(data=data, x=data['Chol'])
```

Out[36]:
```
<AxesSubplot: xlabel='Chol', ylabel='Density'>
```



In [38]:
```
sns.kdeplot(data=data, x=data['RestBP'])
```

Out[38]:
```
<AxesSubplot: xlabel='RestBP', ylabel='Density'>
```



In [ ]: